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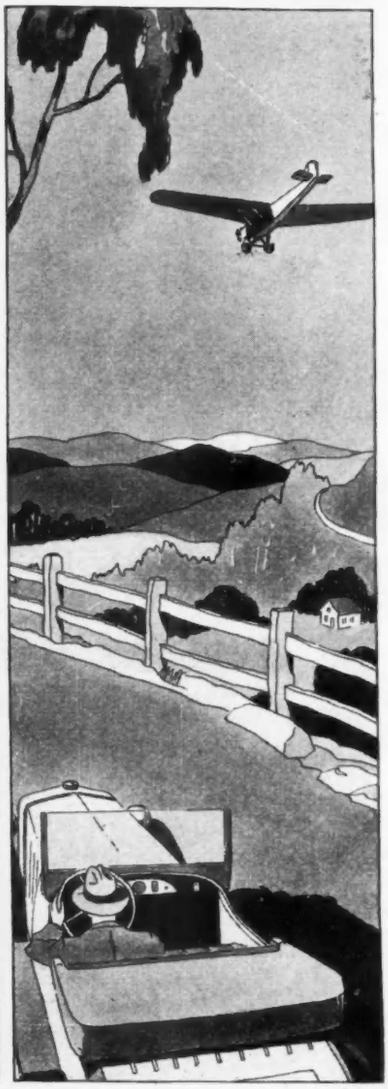

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AUTOMOTIVE INDUSTRIES

VOLUME 63 JULY 26, 1930 NUMBER 4

Better Car Sales in South America Are in Prospect

Tariff will have no effect on trade, as it involves the products of only two countries

By George E. Quisenberry

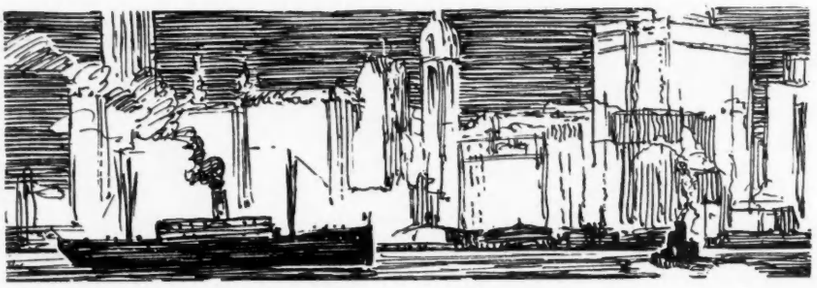
Editor, American Automobile (Overseas Edition) and El Automovil Americano

Argentine and Uruguayan products are the only exports of South American countries affected by our tariff changes. America must continue to buy from these nations and they will require our automobiles

RETAIL sales of automobiles and the various automotive products have been much heavier than current imports through the various countries of South America thus far in 1930. Stocks have been reduced to a normal or even sub-normal point in numerous territories, and already new buying has commenced that may be expected to enlarge as the spring and summer season approaches in the countries below the equator. June, July and August are the months of cold, rain and fog in the southern part of Latin America, the warmer weather commencing with September, when sales normally enlarge.

The writer completed in July a trip of investigation through Latin America of some months duration, involving travel of more than 15,000 miles, contacts with the motor trade and with general business and banking houses, in Peru, Chile, Argentina, Uruguay and Brazil. Conditions are not everywhere similar but very general agreement was evidenced that the latter months of this year, with the warmer weather, would see the automobile business returning to a more highly satisfactory state and would necessitate new importations.

In discussing these countries, which make up a heavy part of our export market and which are predominantly American in their use of automobiles, first reference must be made to the new American tariff. The writer, in the few weeks since he has returned to the States, has been vastly surprised at the misinformation existing here as to the probable effects of this revision in South America. Most American executives seem to think that all South America is enraged at the tariff and that our trade with this whole area will be seriously curtailed, possibly with reprisals against our automobile business. Such a feeling is, of course, incorrect. Of the whole of South America, the products of only two countries are in any way affected by tariff



changes. The countries of Brazil, Chile, Peru, Ecuador, Bolivia, Colombia and Venezuela—which are large buyers of automobiles and automotive products—are in no way concerned with the American tariff. The products we buy from them—such as coffee, nitrates, oil, certain kinds of fruits, minerals and a host of other things—mostly are free of duty into this country, or the tariff is unchanged. There is no concern of any sort in these countries about the tariff revision, nor will there be any.

Countries Affected by Tariff

That leaves two countries of South America whose products are affected by the tariff. They are Argentina and Uruguay. Our imports from Argentina consist chiefly of wool, linseed, hides, casein, quebracho (which is used in tanning) and other special products. Uruguay ships wool, hides and canned meats. The only anti-American propaganda in South America because of the tariff is in those two countries but, when the facts are known, it is probable that our trade will not be as much disarranged as many of us had feared. Several grades of wool are produced, of which the grade of most important use in America was increased by only about 10 per cent, or three cents a pound. The computed ad valorem rates on wool are advanced from 36.06 per cent, as previously, to 39.63 per cent in the new tariff. It may strongly be doubted that this three per cent increase will cause any great change in our buying of Argentine and Uruguayan wool. Canned meats are increased to six cents per pound and apparently the duty has been doubled. But, according to American packers in Uruguay and Argentina, the increase can be absorbed, under present costs, and the market continued. That was stated to the writer in Montevideo.

Casein duties from Argentina have been sufficiently increased to make the further import of that mill product questionable. Linseed, of which we must buy heavily from abroad because of our present lack of production, has been increased from 56 to 65 cents and the change may or may not enlarge production here. Several years will be required to obtain any major change in the American output that would affect our imports from Argentina. Linseed is a product that we must have and, consequently, must import, regardless of price. Hides are another product that we must import and the 10 per cent duty on cattle hides will scarcely change our buying. Other classes of hides are unchanged in the new tariff. Our annual imports of hides total an approximate $100,000,000, determined by the fact that our farms and ranches do not have the animals to supply the normal American requirements. We will continue to import hides, paying slightly more for them. Quebracho is an Argentine product that we do not produce and on which there was no change in duties on imports into the United States.

Both Argentina and Uruguay have protested our tariff changes. Propaganda has been rife there but the writer can deny absolutely the statement published two months ago in a New York newspaper that Argentina had begun a revision of the automobile tariff as a reprisal against the American duties. The writer was in Argentina at the time of that report; was asked to investigate it, and did so. No such revision is being made and the publication in New York of the report was either from ignorance or from an attempt to capitalize on untrue propaganda. As America must continue to buy Argentine and Uruguayan products, so will these countries require our automobiles, because of an essential need for them as transport vehicles.

The writer was also in Uruguay shortly after publication of the resolution of the Uruguayan Rural Federation asking the government to embargo American automobiles for a period of two years, on the theory that automobile buying had affected Uruguayan exchange. Investigation of the incident in Montevideo indicated very little expectation among the motor trade that such action would be taken. The association was not in complete agreement itself on the matter. The government depends too largely on revenue from the motor trade and from automobile owners to make its adoption likely and only one man in the trade, who was an American and not a Uruguayan, had ary fears of the future.

Sales Resistance Results

The tariff is setting up a sales resistance in these two countries, it is true. But the resistance has been greatly over-emphasized, largely because of the political factors involved. The causes of recent depressed business in Argentina and Uruguay were two-fold. In Argentina, it was drought that last year reduced the wheat, linseed and corn crops, so that the national income was reduced. Uruguay suffered from the lowered prices of wool.

Then, too, the back-wash of the Wall Street troubles was a serious, psychological deterrent that did more than any other thing to stir up business discontent in all of Latin America. We in the United States, after our orgy of pessimism, are beginning once more to buy raw materials from abroad. Already steamer lines to South America, commencing with July, report increasing traffic. We have recommenced our loans to Latin America and other countries, an outpouring we did not make in 1929 and

which is of major importance in our whole international commerce. With the resumption of more normal business here and the consequent enlargement of our importations of such products as coffee, wool, etc., we will see a steady rise in the commerce of Latin America and, without question, one of its first manifestations will be in the automotive industry. Of that we can be certain.

Let us study each country, among those visited by the writer, for its automotive outlook, beginning with the most important.

Argentina—Ford is assembling in excess of 100 cars and trucks daily at Buenos Aires and country dealers are behind on orders. Plant is being enlarged. General Motors is employing about 1000 men in its Argentine assembly plant. Stocks of unsold cars in the custom house as the year commenced probably exceeded 15,000 units, or about three months supply based on the lowest year's sales since 1925 or about two months supply as of last year's sales. Imports decreased promptly in February and March and stocks of all except three or four lines were down practically to normal levels by May and June. Nearly all of 1930 models have now been introduced in Argentina. One dealer in Buenos Aires has failed this year, but no importer. Argentina operates about 375,000 automobiles and has about 3000 points of wholesale and retail distribution and resale, many of them as fine and excellent as any establishments in the United States. About 85 per cent of the automobiles are owned and used on the farms and outside of the city of Buenos Aires. Drought caused reduction of national income in 1929. Nation-wide rains have now fallen, in April, May and June, giving promise of normal harvests for coming crop, which can be sold profitably even at present levels. Gasoline prices have been reduced and no evidence exists that car and truck operation has been curtailed. Stock-taking in June (which is the winter period) showed reduced stocks. Exchange has been off about 14 per cent, during the winter months, of reduced exports.

Argentine Has High Hopes

Lower exchange, however, stimulates exports which will be good for the country. Anticipated in Buenos Aires that a loan of $100,000,000 will be obtained in New York probably in September or October, which may restore exchange. Automobile show, the most important event of Latin America, will again be held in November and trade optimism began returning in May. Outlook much more normal and car and truck imports should equal or exceed five-year average.

Uruguay — Exchange, about 15 per cent off par, follows Argentina and will restore itself with Argentine peso. Stocks light except on one line of cars. No dealer failures. Country has built fine system of roads and urbanization work at Montevideo has greatly increased market. Automotive duties are high. Pick-up has lately been noted on equipment lines. Wool crop is now moving largely by truck and heavier truck buying is in prospect. Loan recently concluded in New York for $17,000,000 gold. Ford and General Motors maintain assembly plants in Montevideo. Country has many kilometers of concrete road and, as summer resort for the River Plate territory, has a heavy tourist traffic. Will shortly complete 180-km. concrete road to Colonia, opposite Buenos Aires, which will be connected by ferry on which tenders already have been asked, to stimulate touring.

Brazil Shows Progress

Brazil—Sales have been light for year and stocks were not liquidated by early June, although considerable progress had been made, particularly of closed models, of which new buying may be necessary shortly. Stocks of open models probably will be adequate for most of this year. Sales are more nearly normal in city of Rio de Janeiro than elsewhere, with Sao Paulo city sales considerably ahead of country sales. Coffee position is serious, as country holds overstocks and prices low. General Motors is operating fine new plant in Sao Paulo. Ford contemplates enlargement of present assembly branch in Sao Paulo and maintains operations additionally in Rio de Janeiro, Pernambuco and Porto Alegre. Export tax on coffee is lowered in July and increased shipments of coffee in prospect from that date, as evidenced from shipping reports. Reduced general imports and maintenance of fair volume of exports gave Brazil much larger favorable balance of trade first half of 1930 than same period of 1929. Highway building continues. New concrete road from Rio de Janeiro to Petropolis, completed in July, 1930, about 60 km., an unusually fine engineering job.

Truck traffic is growing rapidly over highway net in Sao Paulo state, Rio de Janeiro, Federal district and other parts of country. Truck traffic over 600-km. road between Rio and Sao Paulo becoming important factor. Country trade has been dormant. American tariff does not affect trade. Proceeds of £20,000,000 Sao Paulo loan became available in July. Exchange has been maintained fairly steadily and is only fractionally lower than in 1929. Revenues of highway department, which is expending large sums in road improvement, have been maintained, indicating automobile operation continuing heavy. Diversification of industry and crops proceeding. About 40 per cent, or more, of country's income depends on products

other than coffee, including many manufactured products, several of which are normal, silk, textiles, sugar, tobacco, oranges, bananas, cattle, minerals, diamonds, precious stones, etc.

Peruvian Stocks Normal

Peru—Largest crop is cotton and cotton prices are most satisfactory barometer of trade. With lower prices this year, trade has declined and imports have been small, although all except a few of 1930 car lines were introduced fairly early in year, indicating that stocks are in proportion to immediate sales. Much new public works construction has been completed within past two or three years. Three concrete roads opened between Lima and Callao and concrete road has been extended practically to Chosica from Lima, where several new roads commence toward the crest of the mountains. Long-distance driving is commencing in Peru and it has become possible to drive practically from north to south, although roads not of the best. Exchange has been maintained and collections are fairly normal. Good distribution, including several fine new establishments, is available at Lima. Peruvian products unaffected by new American tariff. Merger of existing bus lines in Lima and suburbs probably will be effective in forming company operating 250 units over many routes. Announced plans of merged company, if negotiations are successful, will require many new buses.

Chilean Business Satisfactory

Chile—Automobile business very satisfactory, currency is stabilized, public and private construction active and country is being largely rebuilt, with many changes at Santiago. Political conditions satisfactory, reflecting high character of administration of President Ibañez. Annual expenditures total $100,000,000 pesos (about $12,000,000 gold) for highway improvements. Truck traffic mounting steadily between Valparaiso and Santiago, due to high cost of rail transport, and completion of large part of the 180-km. concrete road between these two cities. Low prices for agricultural products deterrent to business in south. Nitrate production of marginal producers curtailed in north. Large amount of public and private building maintaining country through present adjustment. Guggenheims are expending 35 millions gold in mining and nitrate improvements. The national nitrate company, with Guggenheim finance, to take over all producers, and with capital of 375 millions gold, has been announced.

Automobiles are being sold in about 50 cities and towns. Ford deliveries are behind demand and assembly branch at Santiago is being enlarged to permit 33 per cent increase from present output of about 30 cars and trucks daily, with approximately 300 employees. New bus regulations, calling for heavier equipment, are being enforced in Santiago and Valparaiso which will necessitate replacement during the next few months of at least half of 600 buses in Santiago and several hundred in Valparaiso. American tariff does not affect trade.

The automotive visitor to these South American countries will be struck by the modernization of the cities, the large amount of public work under way, the extension of rural highways and, particularly, by the surprisingly high character of the establishments serving the automotive trade. In any of the major cities—such as Buenos Aires, Santiago, Lima, Rio de Janeiro, Montevideo and Sao Paulo—are dealer and distributor places, not to mention garages, service stations and nets of filling stations, far finer than most automotive executives have ever imagined. In such interior Argentine cities as Cordoba and Rosario, which the writer visited in viewing the interior market of Argentina, are large, well-equipped dealer establishments, representing various lines, many of them new and many of them having even more complete equipment than would dealer places serving a similar number of automobiles in this country. The country district is the major market in Argentina, of course, and many of our Argentine distributors reported that at least 80 to 85 per cent of their total business was outside of Buenos Aires.

Highway Programs Progressing

Brazil has progressed with its highway program much further than the other countries and the highways leading out of Santos, Sao Paulo and Rio de Janeiro, of which a goodly portion are concrete, are really fine roads. The coastal road from Rio, skirting the shore for many miles, is one of the most picturesque—and well surfaced—highways that could be imagined. The road over the mountains to Petropolis is a beautiful climb, top-gear all the way, carefully fortified against the rains and well protected. Uruguay has built many miles of city and country roads, on carefully worked out plans, for major roads to radiate from Montevideo in five different directions. The coastal road, leading to the ferry connection for Buenos Aires, will be all concrete and, completed next year, will greatly stimulate tourist traffic. The mountain roads of Peru, built under the compulsory highway labor law, to pierce the high Andes, are breath-taking roads, opening up territory for motor transport that has never known wheeled vehicles, only the slow laborious traffic of the llama and the donkey. The task of the West Coast countries has always been that of piercing the mountains, which parallel the shore, and this is now being done with roads that, while not boulevards, are nevertheless carrying a surprisingly large traffic of trucks and cars. Chile is constructing a longitudinal road, from north to south, that will traverse the rich central plain, much like the Central Highway through the Island of Cuba. Cuba is building her Central Highway under a single contract. Chile is linking up section by section and much progress has already been made.

Since returning to the States, the writer has been surprised by the apparent pessimism that affects the

industry concerning Latin America. The feeling here is far more pessimistic than it is in these countries themselves. Dealers and distributors themselves have no fear of the future months. Realizing keenly the limitations of the past months and, of course, knowing the seasonal trends, they are practically without exception of the opinion that selling will enlarge as the year proceeds. A good market is assured for Uruguayan meats, cattle and wool, the clip of which begins in October. The Argentine has already had the rains which insure more normal crops in the present season and country sales will rebound as the warmer weather approaches in September. Enlarged movement of coffee was in prospect from Brazil. The currencies of both Argentina and Uruguay have already rebounded considerably from the low points of several weeks ago and so has Brazilian exchange which, however, has been practically stable, except for a few days in late June and early July. The Chilean peso has not fluctuated at all and the Peruvian pound has been much more stable than even the Peruvians had expected.

All of which may be taken as a rather certain augury that the automobile business has only halted in the first months of this year in its onward march. Many distributors and dealers expressed themselves to the writer as being pleased that the factories had not pushed them this year, permitting them to clean up stocks, revise their credit bases, and to prepare for the more active months to come. Stocks on many lines are low and, on some products, the shelves are practically bare.

The entire South American region is one of particular importance to the American industry. It is a section that is and should continue to be predominantly American in its automotive development. No automobile of other than American origin now has any sales of consequence in these regions. A few European-made trucks have been sold and here and there may be found European-made tools. But in the great majority American products prevail. We have made many mistakes in the development of our business in these areas and there is much for which we can be criticised. But there is also much for which the industry should be praised and evidence is lacking that the automotive trade will not continue its dependence on our products.

We have one supreme weapon—other than that of price and the general suitability of our product—in our trade efforts throughout Latin America. That is, speed of delivery. The air mail, which is now giving a high performance record, brings even Buenos Aires and Santiago, the most distant points, within seven or eight days of the factories. Ships clear from New York for the East Coast points every week. Long distance telephone is available from Uruguay, Argentina and Chile, in case of need, and in the few months of its operation it already has been used extensively by the automotive industry.

So much new wealth has been created—Argentina has had only one year of unfavorable trade balance in the last six years and millions of permanent productive improvements have been invested in Brazil, Uruguay, Chile and Peru—and the general standards of living have increased so much, that the present adjustment will be made far more quickly than have past depressions been corrected.

We can contribute in large measure to speeding up this adjustment by being more optimistic and confident of the future of our dealings with these countries. Because, when all is said and done, the automotive trade is too well established, with too many employees and is contributing so much to these nations, for it to be halted very long. The writer, through his recent trip and his long acquaintance with the motor trade of Latin America, believes positively that the turn has already been made and that the industry will progress far in its Latin American development with the new season a few weeks hence.

Reciprocity in Empire Trade

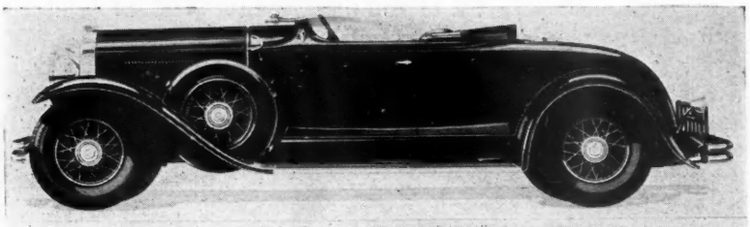
Particular efforts are being made at present by financial and engineering organizations in Great Britain to extend trade between the mother country and the dominions. At a meeting of leading bankers held in London on July 2 a resolution was adopted in which the belief is expressed that the immediate step for securing and extending the market for British goods lies in reciprocal trade agreements between the nations constituting the British Empire.

"As a condition of securing these agreements," the resolution continues, "Great Britain must retain her open market for all Empire products, while being prepared to impose duties on all imports from all other countries."

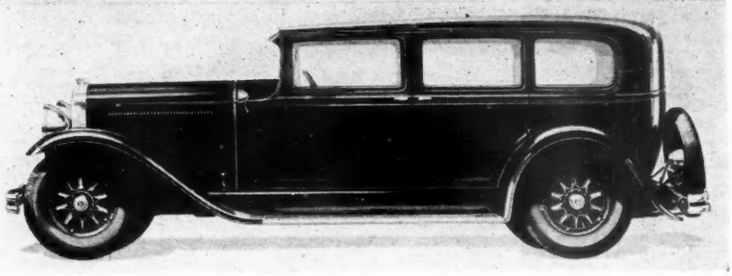
On the following day the Grand Council of the Federation of British Industries decided to appoint a committee which is to be instructed "to ascertain the views of members with regard to the adoption of such a fiscal policy by this country as will permit of a wide extension of the policy of reciprocal agreements between the United Kingdom and the dominions on the basis of mutual preference in their respective markets," and "to ascertain the views of the members as to whether or not a more general application of safeguarding duties would contribute materially to the restoration of prosperity to British industry."

Four Eight-Cylinder Chassis Comprise

Buick eight 1931 roadster



Buick 1931 sedan

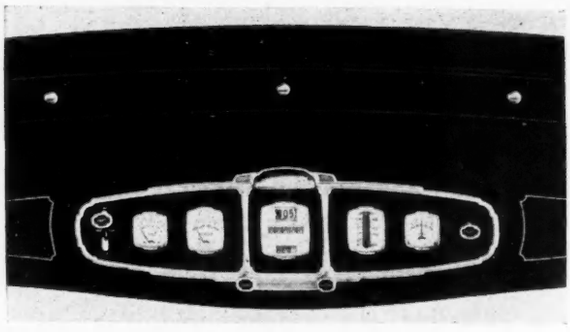


FOUR eight-cylinder chassis models, all bearing the Buick name, constitute the offering of the Buick Motor Co. for 1931. These are the first straight eights to be produced by any division of General Motors Corp. The Marquette name has been discontinued, but the model sold under it in the past has been replaced by one of the new eights. All of the four new chassis are of generally similar design and incorporate such mechanical features as overhead valves, oil-temperature regulators and air-inlet silencers, while synchro-mesh transmissions are fitted on the three larger models. The bodies have been improved structurally.

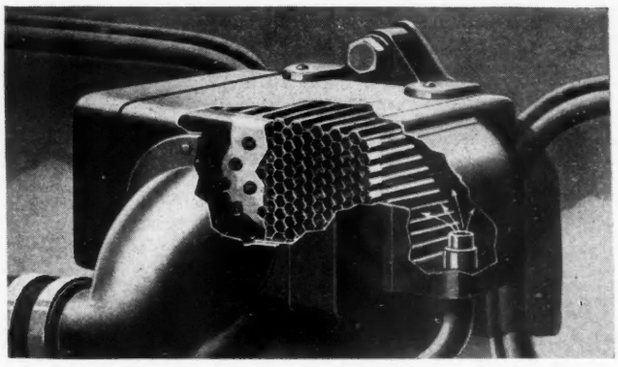
The four new chassis, designated as Models 50, 60, 80 and 90, cover the same price ranges as the former Marquette and the three Buick sixes. The only car which differs materially in appearance from its predecessor is the Model 50, replacing the Marquette, which resembles the other new models.

Considering the offering as a whole, the outstanding characteristic is the consistency of design. Bodies all look alike, the difference being mainly in dimensions. Mechanically the same is true, with certain reservations, as the lowest-priced model does not carry the synchro-mesh transmission, and the two highest-priced chassis have double-plate instead of single-plate clutches. As regards body equipment there is a gradual stepping up in luxuriousness from the lowest to the highest-priced line. Prices on the whole are slightly higher than last year, the increases being only from $25 to $35 on all models.

The question naturally arises, "Why did Buick go to straight eight instead of to the Vee type?" As the writer sees it, the answer is quite simple. The straight eight enabled Buick to retain virtually all the major features which have characterized the Buick sixes for so many years, whereas the Vee type would have involved radical departures in design. The new eights are as close to the previous Buick six engines in design as it was possible to make them. For one thing, the straght eight enabled Buick to retain its valve-in-head design, which would have been extremely difficult with a Vee-type engine. And even if the valve arrangement had been retained, the details of design would of necessity have differed so widely that it would have meant starting all over again in this particular respect.



Dash assembly with wood-grain finish



Cutaway view of oil temperature regulator

Buick's 1931 Line

Synchro-mesh transmission on three higher-priced models

Prices are increased slightly

By Athel F. Denham

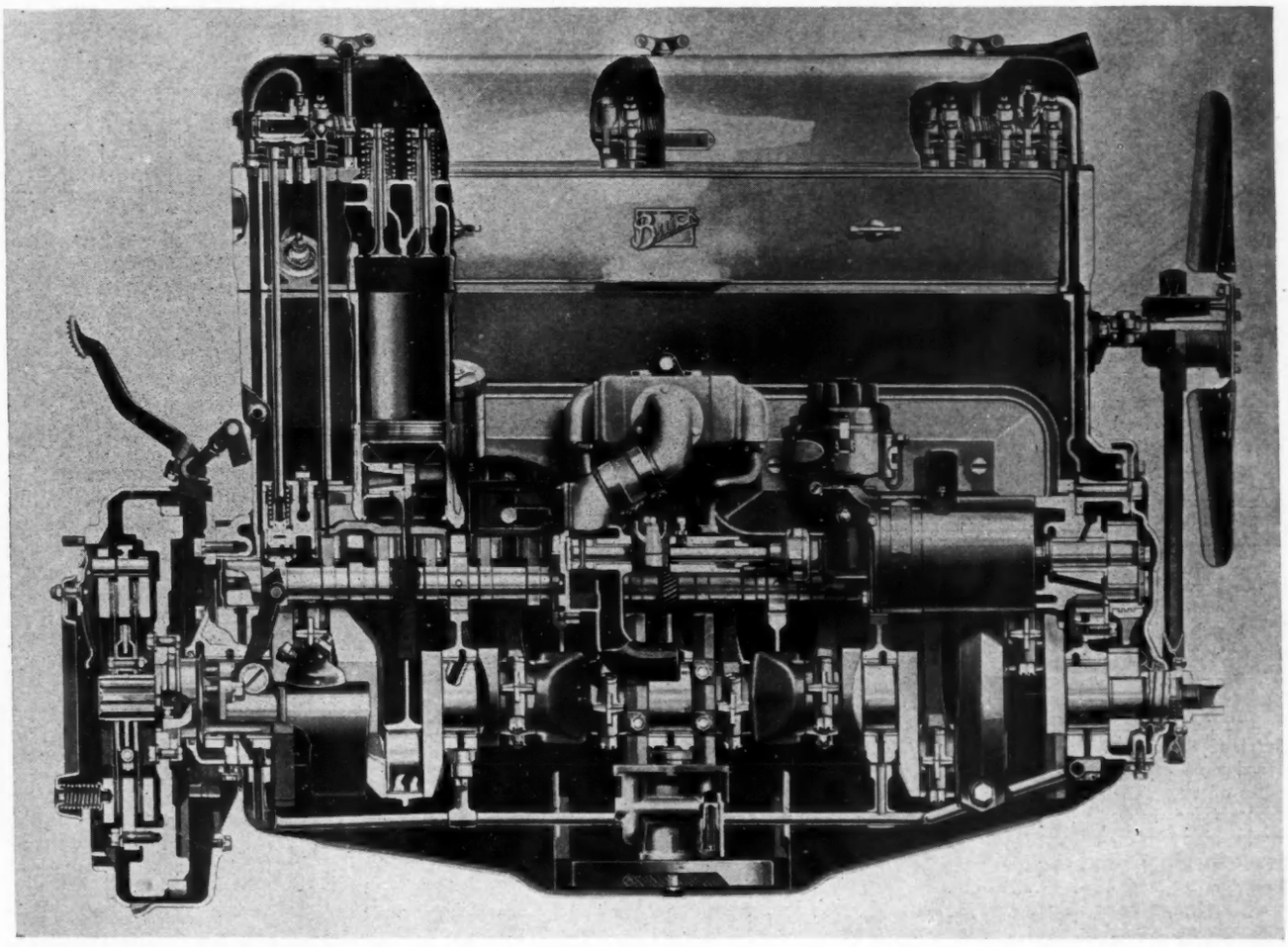
Just what close adherence to a tried design means is well illustrated by the ignition system of the new Buicks. Except for the breaker cam, these units are identical with those used on the six-cylinder 1929 models. These units are of the single-breaker type with single coils and condensers, yet they seem to have proven thoroughly adequate for the new eights.

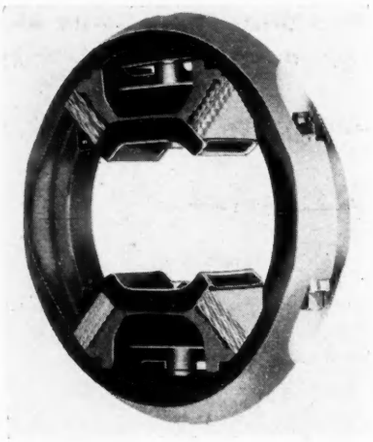
For smoothness of engine operation exceptionally heavy crankshafts are used and are counterweighted and provided with real size harmonic balancers.

The timing characteristics of an eight-cylinder engine have a tendency to set up surges in the intake manifold, which at high power output and high engine speeds produce an organ-pipe effect commonly known as power roar. To break up these surges, or at least to prevent the vibration of the column of air in the manifold from extending beyond the carburetor, Buick has adopted a combination of air-cleaner and silencer. Considerable attention has been given also to the prevention of the transmission of other noises to the inside of the body. For instance, the inside of the dash is lined with ¾ in. of Celotex, on top of which there is a ½-in. thickness of felt. Front-compartment mats and rear-compartment carpets also are heavily felt-lined.

Returning to the mechanical features, the synchro-mesh transmission, used on the three larger chassis, is probably of greatest importance. It is based, of course, on the design of the transmission used in the Cadillac and LaSalle models, although it has been considerably simplified and changed in detail. The major difference between the Buick unit and that used by Cadillac is the absence in the former of a mechanism which automatically times the shift. The shift into second speed

The new Buick eight-cylinder engine partly in section, showing the oil-temperature regulator at the center - - - -





Ring-type torsional balancer

or high in a synchro-mesh transmission, it will be recalled, is based on the use of cone clutches to synchronize the speed of the gear to be engaged with that of the propeller shaft and transmission main shaft. By the design of the cone clutches in the Buick transmission, exceptionally quick synchronization has been made possible, so that an automatic timing mechanism to delay the engagement has been found unnecessary.

The cone clutches are exceptionally large, and the bronze female parts of the clutches are finished inside with a network of cross-grooving, the purpose of which is to allow the oil entrapped between the two parts of the clutch to be squeezed out quickly instead of forming a lubricant film and thus delaying the taking hold of the cone clutch.

There are two sizes of transmissions, one for the 50 and 60 and one for the 80 and 90. The adoption of the synchro-mesh transmission necessitated one departure from long-standing Buick design practice, this being in the clutch. The successful operation of the synchronizing clutches with a rapid shift is, of course, dependent on the amount of inertia which the clutches have to overcome. Experiments indicated that the lower inertia of a single-plate type of clutch provided more satisfactory operation than the multiple-disk type formerly used on Buick cars, and single-plate clutches, therefore, are now used on the two smaller models and double-plate clutches on the two larger ones, on which the use of the single-plate type would involve too large an outside diameter. The driven plates of all clutches have spring-cushion dampers incorporated in them.

To meet conditions of higher oil temperatures in modern engines, Buick has adopted a temperature regulator for the oil in the form of a small inclosed radiator located at the water outlet to the cylinder block, above the oil pump. Water from the pump flows through the tubes of this radiator on its way to the block, while the oil from the oil pump flows around the tubes on its way to the bearings. By properly pro-

Principal Buick Specifications

Models	8-50	8-60	8-80 and 90
Cylinder bore	2⅞	3 1/16	3 5/16
Piston stroke	4¼	4⅝	5
Piston displacement	220	272	344
Compression ratio	4.8:1	4.63:1	4.5:1
Hp. rating	77 at 3200 r.p.m.	90 at 3000 r.p.m.	104 at 2800 r.p.m.
Max. torque	156 lb.-ft. at 1400	200 lb.-ft. at 1600	250 lb.-ft. at 1400
Crankshaft diameter	2 5/16-2 9/16	2 5/16-2 9/16	2 9/16-2 13/16
No. of main bearings	5	5	5
Crankpin bearing	2⅛ x 1 3/16	2 3/16 x 1 5/16	2⅜ x 1 7/16
Crankshaft weight	94.5 lb.	117 lb.	143.5 lb.
Front-end drive	silent gear	silent gear	silent gear
Valve location	in head	in head	in head
Cam-follower type	roller	roller	roller
Piston material	cast iron	cast iron	cast iron
Inlet valve material	nickel chromium	nickel chromium	nickel chromium
Exhaust valve material	silchrome No. 1	silchrome No. 1	silchrome No. 1
Carburetor	Marvel 1 7/16	Marvel duplex 1 5/16	Marvel duplex 1 7/16
Fuel feed	AC pump	AC pump	AC pump
Tank capacity	16 gal.	19 gal.	22 gal.
Cooling control	thermostatic shutters	thermostatic shutters	thermostatic shutters
Engine lubrication	pressure feed	pressure feed	pressure feed
Electrical equipment	Delco-Remy	Delco-Remy	Delco-Remy
Battery capacity	85 amp.-hr.	100 amp.-hr.	120 amp.-hr.
Clutch	single-plate-9½	single-plate-10	two-plate
No. of transmission speeds	3	3	3
Type of drive	Hotchkiss	torque-tube	torque-tube
Final reduction ratio	4.545:1	4.45, 4.18	4.18, 4.27, 4.36
Type of rear axle	semi-floating	¾ floating	¾ floating
Brake type	mechanical	mechanical	mechanical
Brake size	12 x 1¾ in.	14 x 1¾ in.	15 x 2 in.
Front-spring size	35 x 2	36⅞ x 2	37⅝ x 2
Rear-spring size	54½ x 2	55¼ x 2¼	58⅞ x 2¼
Steering gear type	worm and sector	worm and roller	worm and roller
Steering gear ratio	16:1	17:1	20:1

portioning this oil-water intercooler, the temperature of the oil entering the bearings can be kept within a definite amount of the water temperature at the jacket inlet. It is also evident that in cold weather or in starting up, the water will assist materially in warming the oil, especially that important part of it which is on its way to the bearings. The use of radiator shutters assists materially in quickly warming up the water, and this is now taken advantage of to raise the oil temperature with almost equal rapidity. A safety by-pass valve is provided in the oil line so that the bearings will not be starved if the regulator should become clogged for any reason.

While on the subject of engine lubrication it may be well to point out several other features of the Buick lubricating system. The oil pump has increased pumping capacity, about three times as much as last year, and its gears have helical teeth for greater quietness. Camshaft bearings now are also pressure-lubricated.

The crankcase ventilating system has been simplified. The valve lifter compartment is now open to the crankcase, and the fumes are taken from this compartment, across the block, and then down below the engine pan. The crankshaft, with its counterweights and dampers, acts as a blower and this assists air circulation through the case. With the new cars Buick recommends changing oil only about four times a year.

The harmonic balancer on the crankshaft, while differing in appearance from former balancers, has been developed on the same principles. Owing to the increased length of crankshaft it is larger and of ring-type. It is machined, assembled and balanced entirely independently of the crankshaft, to make it interchangeable. All crankshafts are of the five-bearing

(*Turn to page 134, please*)

Buick Prices Compared

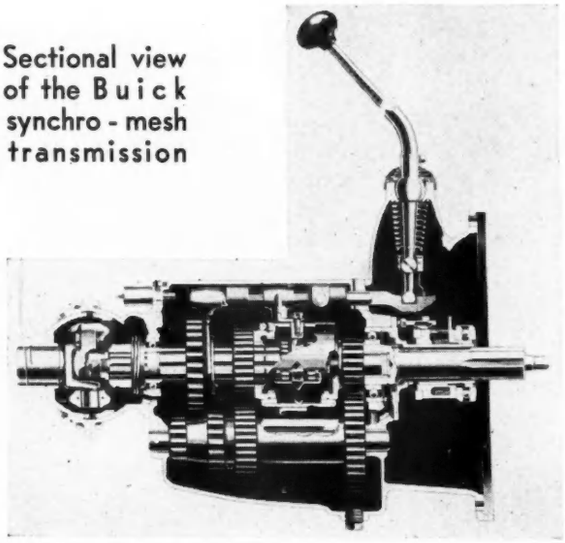
Series 8-50	New Prices	Old Prices (Marquette)
2-p. Coupe	$1,025	$990
5-p. 2-Door Sedan	1,035	1,000
2-4-p. Sport Roadster	1,055	1,020
5-p. Phaeton	1,055	1,020
2-4-p. Sport Coupe	1,055	1,020
5-p. 4-Door Sedan	1,095	1,060

Series 8-60	New Prices	Old Prices (Series 40)
2-p. Business Coupe	$1,285	$1,260
2-4-p. Sport Coupe	1,325	1,300
4-p. Sport Roadster	1,335	1,310
5-p. Phaeton	1,335	1,310
5-p. 4-Door Sedan	1,355	1,330

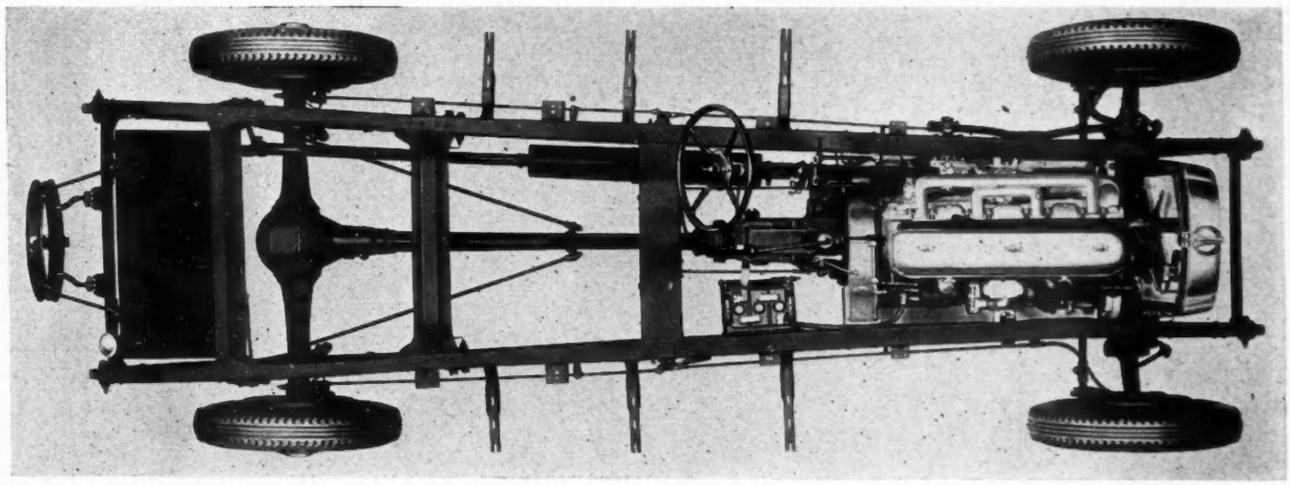
Series 8-80	New Prices	Old Prices (Series 50)
4-p. Coupe	$1,535	$1,510
5-p. 4-Door Sedan	1,565	1,540

Series 8-90	New Prices	Old Prices (Series 60)
4-p. Sport Roadster	$1,610	$1,585
7-p. Phaeton	1,620	1,595
4-p. C'try Club Coupe	1,720	1,695
5-p. Coupe	1,765	1,740
5-p. 4-Door Sedan	1,785	1,760
7-p. Sedan	1,935	1,910
7-p. Sedan Limousine	2,035	2,070

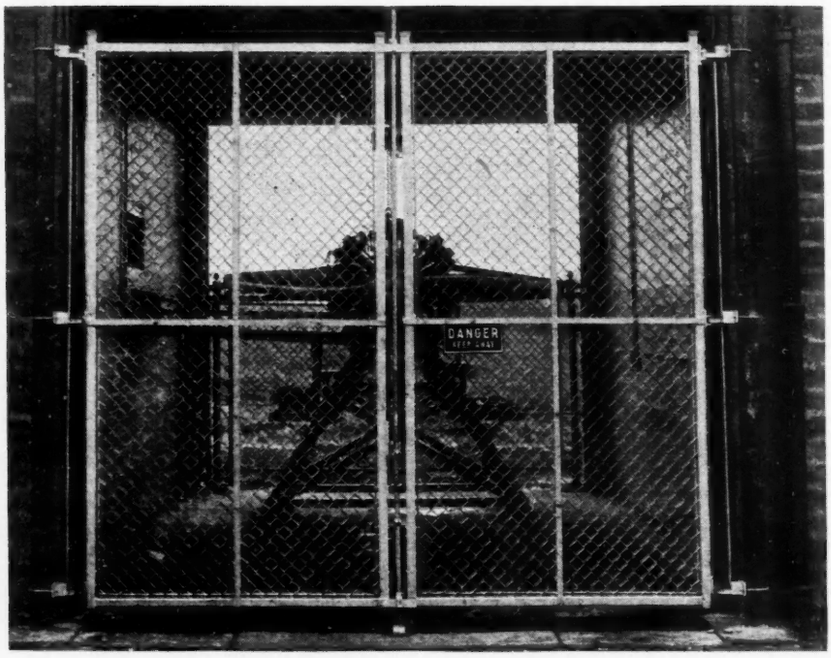
Sectional view of the Buick synchro-mesh transmission



Plan view of one of the larger Buick Chassis



All Major Parts Contribute to Failures



Outside view of aircraft engine mounted on torque stand for Aeronautics Branch type test - - - - -

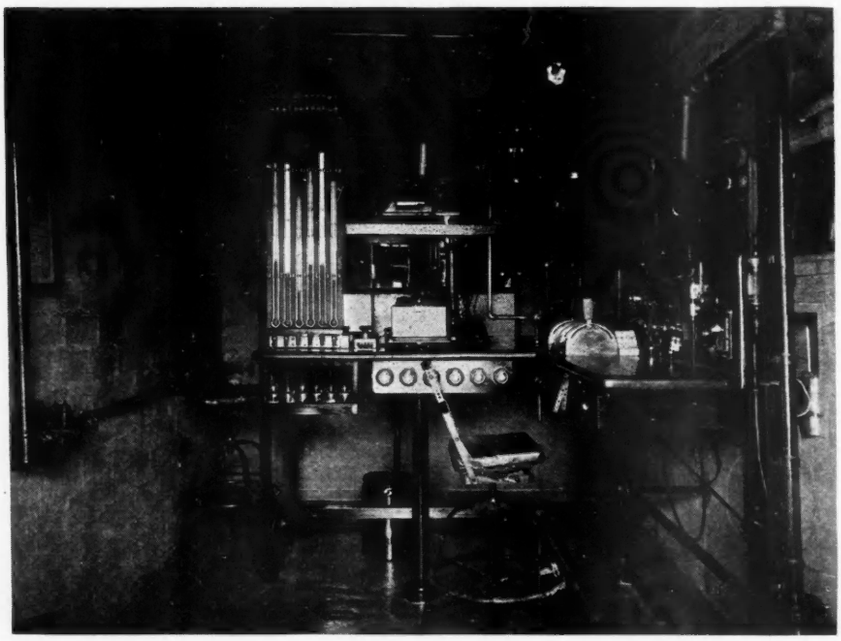
ALL internal combustion engines which are designed or intended for use in aircraft licensed by the United States Government must pass a rigorous type test in order to obtain the approval of the Department of Commerce. The Aeronautics Branch of the department cannot rate as airworthy any aircraft (except certain "light" craft and free balloons) unless it is equipped with a powerplant that is approved by the Secretary of Commerce. This rigid requirement has been in force now for more than two years, the first engine having been submitted to the department for test in March, 1928.

Because of the airworthiness requirements of the air commerce regulations enforced by the Commerce Department, the aircraft engine manufacturer who develops or plans to go into production on a new type of aircraft engine must get a certificate of approval from the department for that particular engine type before he can sell it to aircraft manufacturers for use in aircraft licensed by the Department of Commerce.

This certificate, which is known as an Approved Type Certificate and is generally abbreviated as A.T.C., is issued by the Aeronautics Branch only after gruelling tests that thoroughly establish the dependability of that particular engine type. All testing work of this kind, with the exception of that done on military engines by the Army or Navy, is conducted by the aircraft engine-testing section of the Aeronautics Branch, Department of Commerce, in a special aircraft engine-testing laboratory at Arlington, Va.

This modern laboratory, which is located just across the Potomac River from Washington, is equipped with three torque stands. A fourth stand, moreover, is now under construction.

The frame on which the engine is mounted is capable

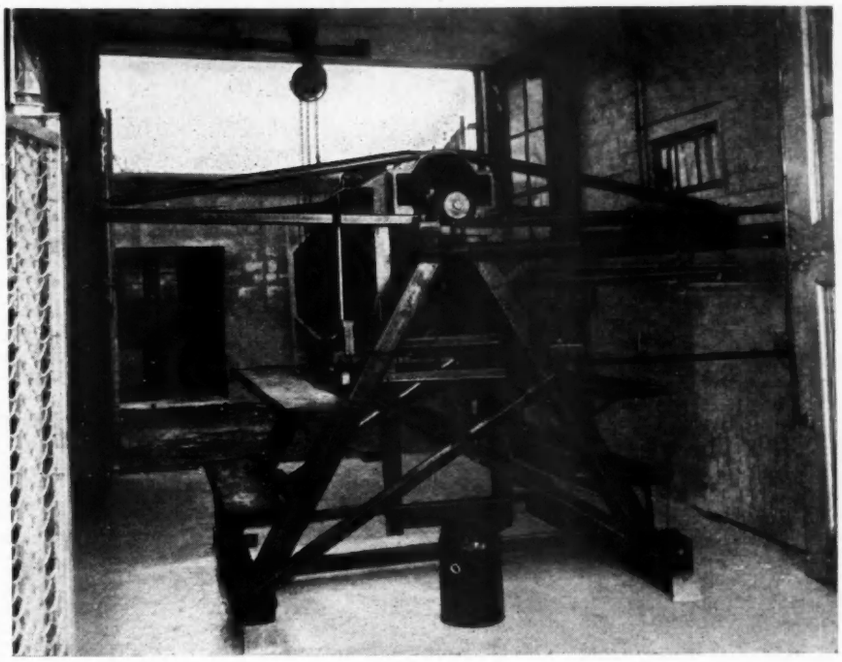


Inside of observation room which houses all instruments and controls used in type-testing aircraft powerplants

in A. T. C. Aircraft Engine Tests

Each component has been responsible for at least one rejection in the type trials made by the Aeronautics Branch of the Department of Commerce in 1929 and 1930

of being rotated about a horizontal axis, and this frame is held in position by a torque arm, the exact reaction of which can be accurately measured. Each of the torque stands is located in a room which is wide open at both ends, so that air may pass through freely as required for the proper temperature control of air-cooled engines. All of the control mechanisms and instruments, however, are located in a weatherproof control and observation room adjacent to the torque stand—thus assuring favorable observing conditions for engineering personnel and test conductors at all seasons of the year.



Rear view of aircraft engine-testing torque stand, which is one of three now being operated by the Department of Commerce at Arlington, Va.

The airworthiness regulations require that before an engine may be submitted for Department of Commerce test, it must have been run by the manufacturer for at least 25 hr. at a speed of not less than 90 per cent of that for which the rating is desired. Five hours of this test, moreover, must have been run at full throttle. A log or record of the manufacturer's test, together with a complete set of the engine drawing in duplicate, must be furnished to the Commerce Department for use of its aeronautical engineers.

Principal among the tests to which each individual type of aircraft engine is subjected by the Aeronautics Branch is a 50-hr. "endurance" run. This 50-hr. endurance test is run off in ten different "heats" of 5 hr. each. During the first 5-hr. test, the engine is run with wide-open throttle, and the propeller fitted during this first run must be such that the engine speed will be no less than the rated speed specified by the manufacturer. The power rating of the engine is then based on the average power output delivered by the engine during this first period. During the remaining nine 5-hr. runs, the engine must be operated at approximately 97 per cent of its rated speed, and the horsepower developed must at no time drop below 90 per cent of the rating.

During the entire 50-hr. test, not more than three forced stops are allowed. When a forced stop occurs, a penalty run of 2 hr. is automatically added to the test period in which it occurred—the Department of Commerce engineer in charge being the sole judge as to what does or does not constitute a forced stop. Before any test starts, the representative of the manufacturer must sign a statement to the effect that the engine is in proper condition for beginning its test.

If, during a propeller-load run, the speed drops to less than 94 per cent of the rated speed, the engine must be shut down, for this constitutes a forced stop. Likewise, in case of excessive leakage of fuel, oil or water, a stop is ordered, for this, too, is considered a forced stop.

Between test periods, minor repairs may be made—if suitable tools are available. It should be noted, however, that minor repairs are generally defined as those which can be made without disassembly or removal of any large or essential part of the engine. Actually, this provision of the regulations does not grant much latitude, for minor repairs are limited largely to such

These two men, employed by the Department of Commerce, are observing the many dials and instruments used in type-testing commercial aircraft engines - - -

operations as stopping small oil leaks, cleaning fouled spark plugs, or adjusting pitted breaker points.

Any repair which can be charged against the testing equipment, on the other hand, is not counted against the engine, even though a stop is required for repairs.

Minor replacements, as well as minor repairs, are permitted between runs. Such replacements comprise those which can be made without the removal of any other essential part and without the disassembly of the engine itself or any of its component parts. Examples of the replacements permitted include the changing of a broken valve spring or cracked spark plug. It should be understood in this connection, however, that both minor repairs and minor replacements between runs are permitted only if suitable tools and necessary replacement parts are immediately available, for no delay of the test schedule can be countenanced.

Major Failure Ends Test

Obviously, the failure of any major part of the powerplant terminates the test at once.

At the completion of the 50-hr. test, a further test is made to obtain the data necessary to plot a power curve, at full throttle, of that particular type of aircraft engine. These data are obtained by varying the torque load. Readings are taken at speeds ranging from 75 to 110 per cent of the rated speed. It should be noted, however, that before a reading is taken at any speed, that speed must be maintained for at least 5 min. Once the block test is completed, the engine is torn down and all parts are subjected to minute and detailed inspection—particular attention being paid to excessive wear and signs of possible failure.

Under this systematic engineering procedure, 68 separate tests had been made up to June 25, 1930, on 45 different types of aircraft engines. It is readily apparent, from these figures, that considerably more than 40 per cent of the various engine types submitted were tested at least twice. In 20 cases, in fact, after an engine type had failed in the first test, improvements were subsequently made in its design or structure which were thought to eliminate the cause of original failure, and the engine type was then retested.

In two cases the engine was retested because, after passing successfully through the first test, the manufacturer decided to try to increase the rating.

Of the total of 68 type tests which have been completed, nine tests were suspended. In most cases the engine was withdrawn by the manufacturer before actual failure occurred, for the purpose of doing further development work at the factory.

The engines which have been approved by the Department of Commerce to date during the past two and one-half years include all on the American market today that may be used in licensed commercial planes. Therefore, their characteristics reflect the practice in aircraft engine design during the greater part of 1928, all of 1929, and the first six months of 1930.

When these characteristics are examined, it is found that 35 of those on the approved list are of the radial, air-cooled type; eight are vertical, air-cooled (upright or inverted), and six are V-type, water-cooled.

Analysis of the various causes of failure reveals that weakness was by no means confined to any particular component. Practically every one of the major parts of the engine—cylinder head, cylinder, piston, connecting rod, crankshaft, crankcase, valve and valve gear—was responsible for at least one failure during the Department of Commerce tests.

In an aircraft engine, valve breakage is frequently a very serious matter, since these engines are generally of the valve-in-head type, and a broken valve almost invariably drops into the cylinder. Two of the points on the valve which are most likely to break are (1) the

junction between the stem and the head, which is weakened by reason of the very high temperature to which the part is subjected, and (2) the outer end of the stem, which may be weakened by the lock for the valve spring retainer. Sometimes provisions are made to prevent the valve from falling into the cylinder if the break occurs near the outer end of the stem, but in the experience of the branch's engine-testing laboratory, they have not proved very effective. If the break occurs at the junction of stem and head, the head frequently drops into the combustion chamber of the cylinder and either the piston head or the cylinder head is almost sure to be crushed during one of the next following up-strokes.

Valve Springs Frequently Faulty

Valve spring failures were quite frequent, probably having been caused in many cases by surging in operation. Where dual or multiple-spindle springs are used, the breaking of a single spring does not interfere greatly with the functioning of the cylinder affected, and, of course, the greater the number of cylinders, the smaller will be the effect on the power of the engine. This truism emphasizes the importance of using multiple springs especially on engines having relatively few cylinders.

In a number of instances pistons also failed, but in most of these cases the cause of the failure lay outside of the piston itself. Not a few pistons, for example, had their heads crushed in by broken valves, and there were several cases of pistons "seizing" in the cylinders—doubtless due at least in part to inadequate lubrication.

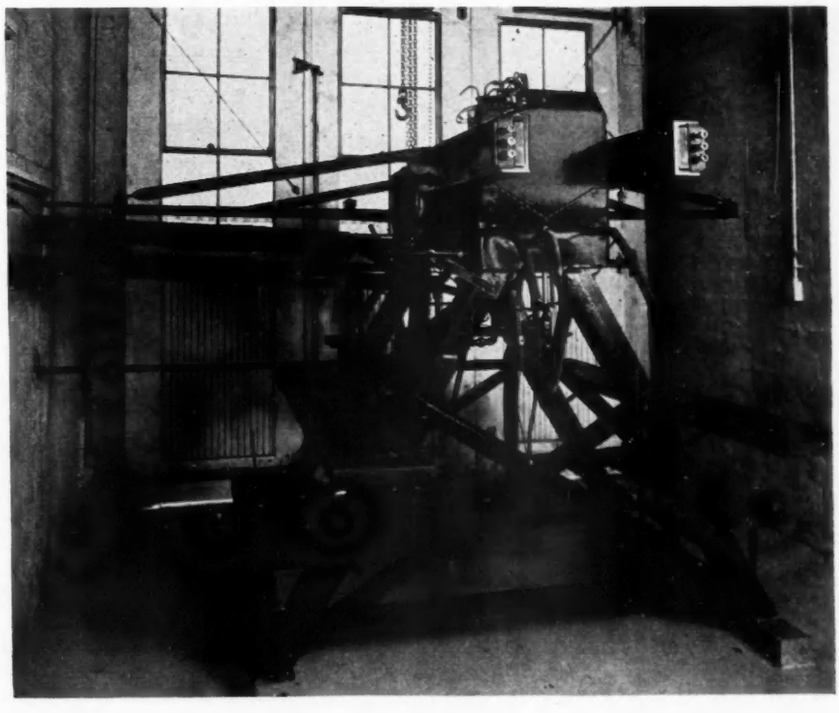
Cylinder heads of air-cooled engines as a rule are made of cast aluminum alloy. In some instances the test came to an end as the result of a crack developing in such a head. When a head cracks, the fault may be either in the materiial, in the design, or in production methods. A poor grade of material will hardly give the resistance necessary to withstand the stresses that may be anticipated. Virtually all metals, moreover, weaken somewhat with increase in temperature, and there is the possibility that owing to an improper arrangement of the cooling fins, sections of the head will reach an excessive temperature. Finally, the head may have become defective through improper handling in production, such as inadequate annealing.

In a couple of cases the holding-down flanges at the lower end of the cylinder broke off and allowed it to come loose from the crankcase. Such accidents should be guarded against by the provision of adequate fillets between cylinder barrel and flange. Crankshafts also broke in several instances. A weak spot in some crankshafts seems to be just outside the front bearing journal, where the tapered seat of the propeller hub begins. The inner end of the keyway seems to be a source of weakness unless the keyway is properly filleted and runs out gradually. In one case of such a failure, weakness at this point was further accentuated by a sharp change in the internal diameter of the shaft, causing a concentration of stress.

Cracks in crankcases, which developed in a number of cases, always lead to an immediate discontinuance of the test. Crankcases are invariably of light alloy, generally aluminum, but occasionally magnesium. Since the crankcase must withstand the stresses and strains incident to the reaction of the explosion as well as those due to torque reaction, defects of this character are very serious. In one case the cylinder studs, which were screwed into bosses cast integral with the crankcase, pulled loose during the test. The occasional occurrence of shrinkage cracks, which were discovered during the tests, is ordinarily a sign of improper inspection during manufacture.

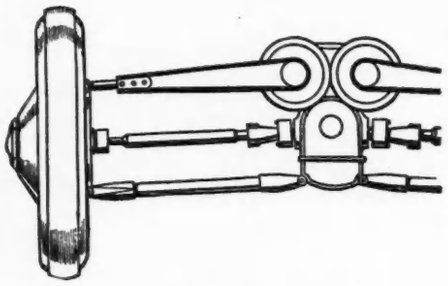
Such accessories as magnetos, carburetors and spark plugs, generally furnished by specialists of which a comparatively small number supply the entire aircraft engine industry, seldom cause any trouble.

(Turn to page 132, please)



Front view of torque stand on which aircraft engines designed for use in licensed airplanes must undergo a 50-hr. endurance run in order to obtain the Approved Type Certificate of the Department of Commerce - - - - -

Radical Changes Conceived for Car of



Independently sprung rear wheel, making use of Adams suspension - - - - - - -

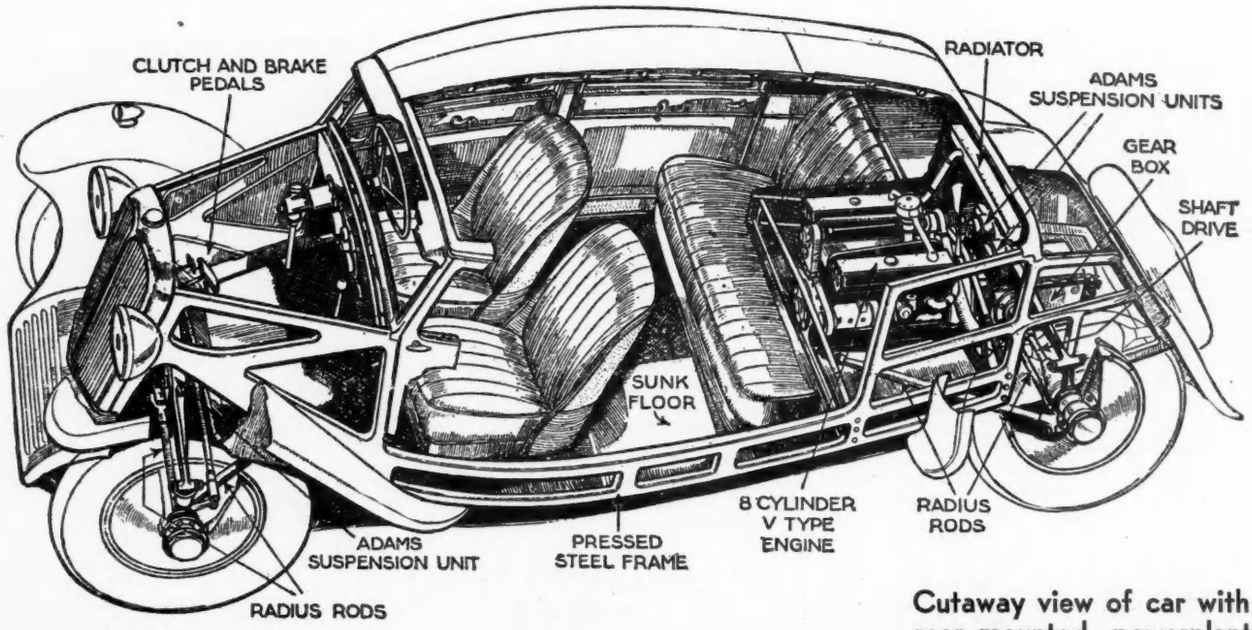
Proposed design includes—
Engine mounted at the rear
Independently sprung wheels
Unit body and chassis frame

A CAR with rear-mounted powerplant and independently sprung wheels, of American conception, is described in *The Autocar* by W. L. Fisher. In England, where there already is one make of car with rear-mounted powerplant in successful production by a long-established maker, this type of design is likely to meet a more favorable reception than here, where it probably would be regarded as extremely radical. The older men in the industry, who are familiar with the fact that all of the earlier American cars had their powerplant in the rear, or, rather under the seats, are likely to be guided in their judgment by that knowledge. This arrangement had to be given up because under the seat or under a rear deck an engine is decidedly less accessible than under the conventional hood in front—and the frailties of the early engines made accessibility a prime essential.

However, conditions affecting the desirability of various features of construction have changed greatly during the past thirty years, and in view of the repeated proposals of chassis with rear-mounted powerplants it may be apropos to investigate the pros and cons of this construction in the light of present-day conditions.

It is not unlikely that the proposals referred to were prompted, or at least influenced, by the development of a number of buses with electric drive in which the entire powerplant is located at the rear. The designers of these buses evidently were of the opinion that the somewhat reduced accessibility of the powerplants in this location was no serious handicap. Of course, the bus may be considered in a somewhat different class from the privately-owned vehicle in this respect, as the bus driver is expected only to drive and not to make any mechanical repairs or adjustments; but the average private driver today does very little else than drive. The engine, of course, is not located under the seat—which in a modern car is entirely too low for that—but under the rear deck, where access to it can be had from the rear by raising this deck.

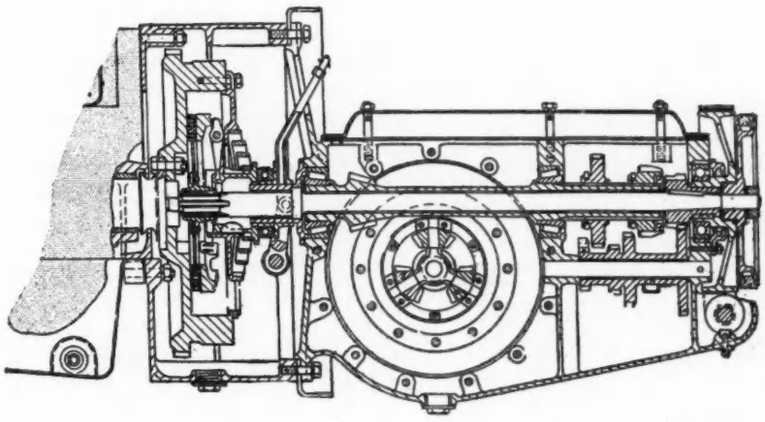
One advantage of a rear-mounted powerplant would be that the occupants would not be annoyed by heat from the engine in hot weather and by engine fumes getting into the car. Occupants probably also would be annoyed less by engine noise in the case of old cars, though this advantage would be offset by the fact



Drawings reproduced from The Autocar

Cutaway view of car with rear-mounted powerplant

the Future



Drawings reproduced from The Autocar

Arrangement of clutch, transmission and final drive

that it would be impossible for the operator to detect any irregularities in the operation of the engine from sounds emitted by it. At the rear the radiator certainly would not have quite the same natural circulation of air through it as when mounted in front, but this could be remedied by a little additional fan capacity, and the delicate radiator core undoubtedly would be better protected.

One of the chief claims made for the car with rear-mounted powerplant is that it would permit of having both the front and the rear seat between the front and rear axles, rather than having the rear seat over or even slightly to the rear of the rear axle. At the present time, the driver and front-seat passenger are greatly favored as regards riding comfort, for their seats are located about midway between axles, where road shocks are reduced to the minimum by the leverage action of the frame. With the powerplant mounted at the rear the front seats would be moved forward, and most of the leg room for the driver and front-seat passenger would be provided under what is ordinarily the engine hood.

The car described in *The Autocar* has independent springing at both front and rear—the so-called Adams suspension. This suspension was offered on the American market about a decade ago. It consists of two metallic members connected by a body of soft rubber which is worked in torsion. One of the metallic members, a housing, is secured to the frame, while the other has a lever arm secured to it. In the design in question the lever arm extends all the way from near the center of the chassis to axle heads at the wheels, hence a very slight distortion of the rubber will result in considerable vertical chassis movement. The arm of the Adams suspension together with a link below it form a pair of parallel links which hold the axle head in a vertical position. Stresses on the wheels are taken care of by wishbone-type radius rods.

Since the modern powerplant is comparatively long, even if a V engine is employed, and could not well be placed completely ahead of the rear axle if arranged longitudinally, a design has been worked out in which the transmission is located back of the rear axle, the engine and clutch being in front. Ordinarily this would make impossible the use of a direct drive, but the introduction of the hypoid gear has removed this limitation. It will be seen from the drawing that the clutch shaft extends completely through the transmission housing and just inside the rear wall of this housing carries the "constant-mesh" pinion. The various sliding gears are arranged on a hollow splined shaft surrounding the clutch shaft, the two shafts being positively clutched together for the direct drive and the hollow shaft driven from the shaft within it through the various gear combinations for the other speeds. Both the fan pulley and the parking brake drum are mounted on the rear end of the clutch shaft.

One rather serious objection to the rear-mounted powerplant is that all control connections naturally are more complicated than with a front-mounted powerplant where the clutch pedal can be mounted directly on the shaft of the shifter fork and the shift lever directly in the cover of the transmission case. Not only the clutch and transmission controls have to be carried underneath the floorboards from the driver's compartment to the rear, but the engine controls also must be carried under the floorboards and up to the carburetor and ignition unit.

In the car referred to a control tube runs down the center of the car, which has the shift lever and parking brake lever mounted upon it. The clutch, brake and accelerator pedals also are mounted on this tube.

The wheels of the car also are out of the ordinary, in that they consist essentially of brake drums with tire rims applied to them. There are six small spacers between the outside of the drum and the wheel rim, which connection minimizes the flow of heat from the drum to the tire rims. The rim is held in place, apparently, against stops on the spacers, by means of an outer conical disk which is held in position by the hub cap.

Another deviation from conventional practice is found in the frame, which also constitutes the framework of the body. The webs of the side rails are pressed with large openings in them to eliminate the weight that adds little to the beam stiffness, and forward of the dash and around the rear seat integral panel frames rise from the side rails. These framed constructions evidently are intended to make up for the lack of chassis support directly underneath the side rails. Chassis and body are supported at the center at both front and rear, and this, of course, makes additional demands on frame rigidity. One cannot help feeling that with a car of this type there would be considerable side sway in rounding corners at speed.

JUST AMONG OURSELVES

As Walter Winchell Might Write It . . .

NEW models are being born apace . . . plenty of them . . . Buick and Chrysler bring out eights . . . Studebaker initiates free wheeling . . . more blessed events are imminent in other passenger car families . . . body design seems to be off to another definite trend based on a style first set last fall. . . .

Bronze statue of R. E. Olds' first pre-twentieth century car is to be made and erected in Memorial Park by City of Lansing . . . that will finally make an honest man of the cub reporter on one of our Chilton publications who many years ago turned in a story of a new automobile in which he referred to its bronze wheelbase. . . . Motor stocks in volved in limited rally while Lammot du Pont predicts better general business . . . maybe somebody will make a dime on the 'Change before the year is out . . . car manufacturers still dissatisfied with used car valuations . . . stocks fairly low in dealers' hands . . . cleanups for new models made this year more satisfactorily to dealers than ever in recent years, it seems. . . .

More Economic Excursions By Henry and Sam

HENRY FORD and his amanuensis, Samuel Crowther, are off to another series of socio-economic discussions in the *Satevepost*. If those to follow are like the first we recommend them as brain stimulants to all automotive executives.

Unless we miss our guess, you will find yourself disagreeing strongly with parts of the reasoning of the Dearborn sage, but —if you are honest with yourself—you will have to do more concentrated and logical economic thinking than you have for some time to provide yourself with air-tight confutation of his economic excursions.

Mental Exercise Derived from Involved Reasoning

WE found ourselves cheering the idea that no lamp posts can or should be provided for weak industries to lean upon, but failing entirely to follow the involved chain of reasoning which brings Mr. Ford to the conclusion that:

"Demand depends upon production, and, so, if production drops, the demand will drop."

In some broad, mystical sense, which we don't understand, this statement might be true, but it doesn't check with most of the facts as we see them. It seems to us that if every automobile factory closed down tomorrow, there still would be a demand for automobiles.

. . . Anyhow, we recommend Mr. Ford's latest articles as good think-tank fillers.

Pull the Weeds First— It Improves Your Golf

REFERRING, as we remember it, to development of sanitation work in Panama, C. F. Kettering remarked in his talk at the S.A.E. summer meeting that, "They went at the job just like all engineers go at a job—the hard way first; then they simplified it later."

Mr. Kettering may be right about engineers; probably he is. But it seems to us that his remark applies equally well to writers, advertising men and business executives of all kinds. Simplicity of conception usually is the result of considerable mental weed-pulling; and most of us would rather play golf than pull weeds—is it not so?

World Sales of Cars Hold Upturn Possibilities

WHILE no firm advance has occurred in passenger car sales, close examination of the figures by months since January in comparison with those for the same period last year does begin to emanate some favorable implications for the first time.

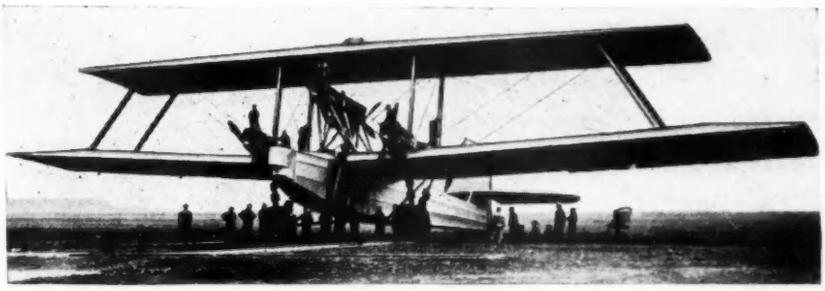
Total sales of American-designed passenger cars throughout the world, including the United States, in 1930 have consistently run more than 20 per cent behind the same month of 1929. The February total, to be sure, was only about 15 per cent behind February of 1929, but every other month until June was somewhere between 21 and 28 per cent behind.

Early estimates of world sales for June, however, indicate a total of something over 391,000 passenger cars, which would be only about 17 per cent less than in June of 1929.

Should July turn out to show an even slighter loss as compared to July of 1929—as is quite possible—we might logically begin to feel that we had statistical backing for the feeling that our business is back on the upgrade. In any case, it is interesting to look at these world sales figures for a moment at a time when domestic sales alone have continued sluggish.—N. G. S.

Six 1000 hp. Engines Power 90 B.P. Caproni

Isotta - Fraschinis, driving tandem propellers, have been responsible for six world records of huge biplane



WHAT is claimed to be the largest airplane built since 1918 has been completed recently by the Caproni Co. of Italy, and is known as the Caproni 90 B.P. It is equipped with six 1000 hp. Isotta-Fraschini engines, giving it a total engine power of 6000 hp., and it is said to be able to take off with a total load of 15 tons (presumably metric tons of 2204 lb.).

It appears to have been designed primarily for military purposes and is said to be a first-class machine for either attack or defense, but with certain suitable modifications of its interior arrangements the machine would lend itself well to commercial uses over long distances.

In the construction of the structural part of the plane steel was used exclusively. The principal members are of high-strength steel tubing and the fittings are machined up from solid billets of chrome-nickel steel. Wings and fuselage are covered with doped fabric, with the exception of the forward part of the fuselage, which has a covering of corrugated duralumin.

A notable feature of the machine is said to be that in spite of its great size and weight (30 tons with full load) it can be piloted by one man. This was made possible by the provision of special balancing arrangements on the various controls, so their operation requires little effort. All of the instruments and engine controls are grouped within easy reach of the pilot.

The Caproni 90 B.P. is described as a "semi-thick-winged" biplane of normal structural design, the top wing having a smaller span than the lower one which has a slight vertical dihedral angle and carries the balanced ailerons. The cell comprises four pairs of main struts and corresponding bracing. A machine-gun turret is installed in the top wing, while the lower wing contains some of the fuel tanks.

The fuselage is of square section and forms part of the central section of the lower wing, from which it is suspended. The manufacturer states that it is of large dimensions and can be inspected from the nose to the tail planes, by which he evidently means that a person can pass through it all the way back to the tail planes. There is a machine-gun turret in the bow, which could be used also for mounting a small rapid-firing gun. Back of this turret there is another fuel tank, and above the latter is the pilot's compartment. Below the latter are the two entrances to the fuselage, adjacent to which the engine starter is installed. Passing on to the rear there follow other fuel tanks, the bomb-storage room and the main machine-gun cabin.

To facilitate landing on rough ground, the landing gear is made with a very wide tread. The landing gear consists of two independent pairs of wheels equipped with ball bearings and 78¾ by 15¾-in. pneumatic tires. Oleo rubber-type shock absorbers are fitted. At the rear of the fuselage there is a sprung and steerable tail wheel.

The engines are arranged in pairs in tandem, one pair on each side of the center on the lower wing, directly above the landing gear struts, and the third at the center of the plane between the upper and lower wings. Each forward engine carries a two-bladed tractor propeller and each rear one a four-bladed pusher propeller. Oil is stored in suitable tanks in the engine nacelle between the two engines.

Dual controls are installed and are arranged side by side. Control motions are transmitted by means of steel cables, while engine control motions are transmitted by rigid links, these latter controls being grouped together between the two seats.

Top wing span	114 ft.
Lower wing span	152.5 ft.
Length	88.6 ft.
Height	35.5 ft.
Total lifting surface	5,340 sq. ft.
Aileron surface	249 sq. ft.
Horizontal stabilizer surface	120 sq. ft.
Elevator surface	59 sq. ft.
Rudder surface	64.8 sq. ft.
Weight empty	15 tons approx.
Useful load	15 tons approx.
Total weight	30 tons approx.
Load per square foot	12.3 lb.
Load per horsepower	11 lb.
High speed	127.5 m.p.h.
Low speed	56 m.p.h.
Ceiling	14,750 ft.
Endurance	7 hours

Factory Overhead

Summarized briefly, this article provides a perspective of the Oakland budget control.

First, we have a positive control of all expense accounts by means of the normal, which the foreman must strive to meet.

Next, we have the real activating mechanism through the suggestion system, which stimulates improvement in all directions, including that of depressing the value of the normal.

Acting in unison, these produce a constant activity in the direction of decreased overhead burden and more favorable operating costs.

THE normal, a factor representing the ratio of the expense dollar to the direct labor dollar, definitely determined for each expense account, is the basic foundation for the factory operations budget control at the Oakland Motor Car Co. Although designed primarily to control and reduce overhead burden, its influence has been gradually extended to embrace practically every element of factory cost.

While detailed cost records and other factual information supplied daily and summarized monthly form the backbone of this system, it is an impressive fact that the system possesses a positive momentum due to the stimulus of certain phychological devices usually considered as intangible or theoretical at the best. To begin with, impetus has been given to the ideal of constantly improving costs, improving processes and eliminating waste in all directions. Responsibility for these functions rests with the foremen, the maintenance department, superintendents and others, all interlocking in their relations.

Application of the principle of non-financial incentive, one of the most potent influences in industry today, imparts to this control system a live dynamic quality with ever-growing momentum. This is fostered by the psychological devices, chief of which are suggestions for improvement, weekly meetings of foremen and superintendents, and other means described more in detail later.

It is quite probable that the exceptional success of this plan and the tangible savings effected thereby are due primarily to the activity of an unusual organization set-up. Briefly, operations have been grouped under two responsible heads, one controlling direct labor operation, the other non-production operations including those of the standards department and maintenance groups. By recognizing the distinctiveness of these functions, the management is enabled to make a better study of the most elementary expense accounts and thus control them most effectively.

Needless to say, introduction of this control system was met with the usual inertia. And intensive educational effort was required to put it over. Although this educational effort cannot be relaxed to any great extent, it already has engendered spirited competition and active cooperation.

And contrary to general belief in some quarters, the control is neither unwieldy nor expensive to operate, since only two men are required to provide the records described here.

Perhaps the best way to visualize the elements and mechanism of the Oakland control system will be to analyze each detail separately and in its relation to the plan as a whole. The organization scheme is so unusual that for simplicity it is shown diagrammatically in Fig. 1. Operations of the entire plant are in charge of a vice-president of the company and, as noted earlier, he has divided the responsibility into two major groups, one concerned with direct production, the other with the non-production activities.

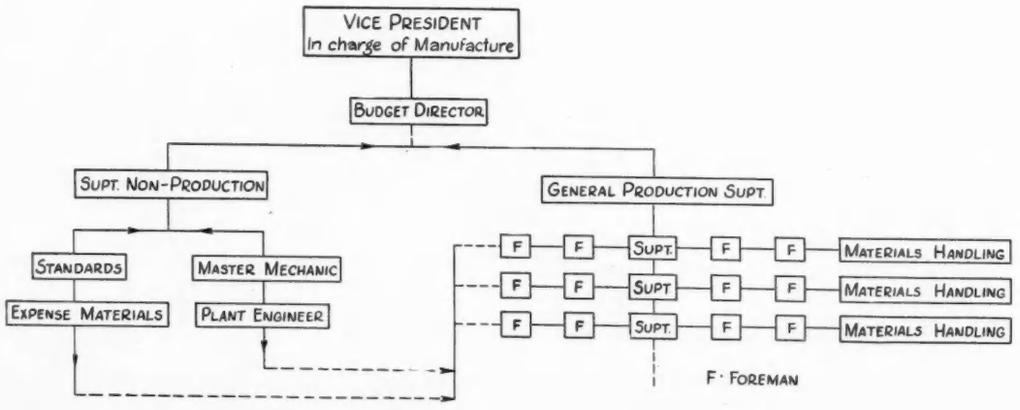


Fig. 1 — Organization chart of manufacturing department of the Oakland Motor Car Co. - -

Reduced by Oakland's Budget Control

Non-financial incentive system imparts live, dynamic quality to labor groups

Plan is neither unwieldy nor expensive

By Joseph Geschelin

Under the general production superintendent are the plant superintendents, who in turn are responsible for the foremen in each department of each plant. On the other side of the picture is the superintendent of non-production activities, whose function extends through the standards department, which controls expense materials in addition to its other responsibilities.

Maintenance, also within his jurisdiction, is divided into two major groups, one under the plant engineer, consisting of laborers, carpenters, electricians, pipe fitters, plumbers and sweepers; the other under a master mechanic, consisting of the machine repair crew (handling repairs and maintenance of new tools, jigs and fixtures) and tool stores and tool disbursements.

One of the features of the control system is a systematic breakdown of expense accounts into their smaller components such as the coordinated maintenance group, operating under one master mechanic; a separate control of expense materials through the standards department as described in a survey in *Automotive Industries*, Oct. 12, 1929, and the recently formed materials handling group, described in *Automotive Industries*, April 12, 1930. All of these activities are correlated and controlled directly through the office of the budget director.

Since the normal is a determining influence and decidedly charts the course of burden costs, its value is determined with unusual care. Indeed, it is a delicate thing to evaluate, because an error here would cause serious difficulty. If too high, the trend of costs may be on the increase; if too low, it may create a disturbance in the morale of the group by reducing earnings. However, with the aid of a good cost system and a practical working knowledge of the plant, initial experimental values are determined which require but little adjustment with later experience.

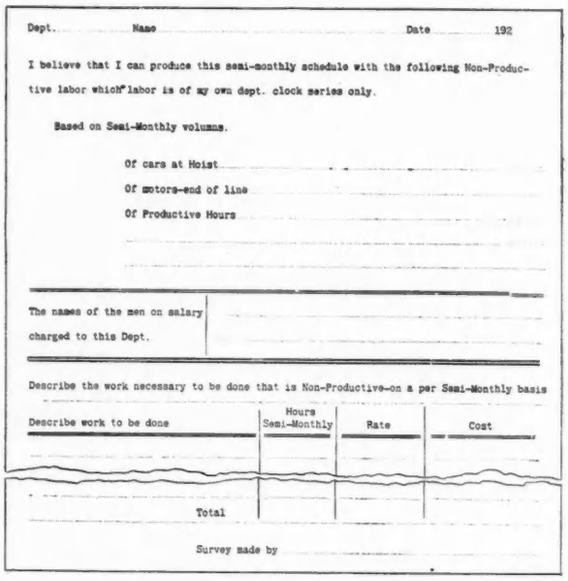
Fig. 2 shows the form often used in making a survey to determine the normal for a specific account. The value of this procedure lies in the fact that the foreman is encouraged to personally aid in making this survey, consequently enlisting both his interest and cooperation in carrying out the normal that is established. Naturally this normal is a flexible quantity and is expected to undergo adjustment with experience.

Now let us examine the mechanism of the control system by analyzing the forms and their function. (Note that the figures used throughout are purely illustrative.) First of these forms is the Daily Burden report, Fig. 3, giving the standing of each account for the plant. This is sent to the superintendent daily, while a similar form giving departmental expense is sent to each foreman. The normal is based upon an estimated monthly volume of direct labor and the daily expense figures are estimated and prorated. The percentages shown here represent the ratio of expense money to the estimated productive labor expense shown at the bottom of the form. The normal per cent for each item is the figure determined by the budget director, the superintendent's function being to reconcile

Non-Financial Incentives

"There are many types of incentives which are not financial in nature. The desire for promotion, to be thought well of by his associates, to excel the record of himself or of someone else, and the pride of achievement are all powerful motives. Perhaps records of performance are the most common incentive that can be termed non-financial. When combined with the proper devices to measure output or quality, these reports show the comparison of a man's present performance with his own past record. Moreover, when the results accomplished by individuals and groups are posted on the bulletin board, they bring into play the sense of rivalry."

From Group Incentives (1930)
By C. C. Balderston
University of Pennsylvania



Dept. ..... Name ..... Date 192

I believe that I can produce this semi-monthly schedule with the following Non-Productive labor which labor is of my own dept. clock series only.

Based on Semi-Monthly volumns.

Of cars at Hoist .....

Of motors-end of line .....

Of Productive Hours .....

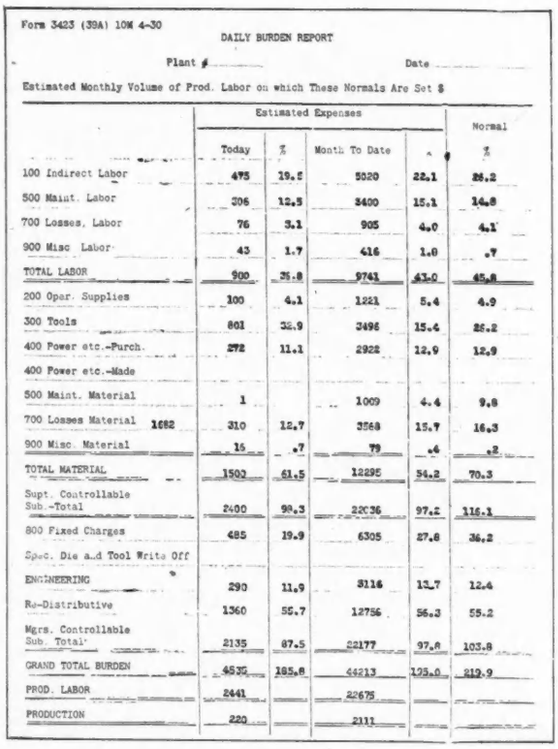
The names of the men on salary charged to this Dept. .....

Describe the work necessary to be done that is Non-Productive-on a per Semi-Monthly basis

Describe work to be done	Hours Semi-Monthly	Rate	Cost
Total			

Survey made by .....

Fig. 2—Survey sheet for determining the value of normals



Form 3423 (39A) 10M 4-30

DAILY BURDEN REPORT

Plant # ..... Date .....

Estimated Monthly Volume of Prod. Labor on which These Normals Are Set $

	Estimated Expenses				Normal
	Today	%	Month To Date	%	%
100 Indirect Labor	475	19.5	5020	22.1	26.2
500 Maint. Labor	306	12.5	3400	15.1	14.8
700 Losses, Labor	76	3.1	905	4.0	4.1
900 Misc. Labor	43	1.7	416	1.8	.7
TOTAL LABOR	900	36.8	9741	43.0	45.8
200 Oper. Supplies	100	4.1	1221	5.4	4.9
300 Tools	801	32.9	3496	15.4	25.2
400 Power etc.-Purch.	272	11.1	2928	12.9	12.9
400 Power etc.-Made					
500 Maint. Material	1		1009	4.4	9.8
700 Losses Material 1682	310	12.7	3568	15.7	16.3
900 Misc. Material	15	.7	79	.4	.2
TOTAL MATERIAL	1503	61.5	12295	54.2	70.3
Supt. Controllable Sub.-Total	2400	98.3	22036	97.2	116.1
800 Fixed Charges	485	19.9	6305	27.8	36.2
Spec. Die and Tool Write Off					
ENGINEERING	290	11.9	3114	13.7	12.4
Re-Distributive	1360	55.7	12756	56.3	55.2
Mgrs. Controllable Sub. Total	2135	87.5	22177	97.8	103.8
GRAND TOTAL BURDEN	4535	185.8	44213	195.0	219.9
PROD. LABOR	2441		22675		
PRODUCTION	220		2111		

Fig. 3—Daily burden report sent to superintendents

actual percentage expense against the normals and to investigate discrepancies.

To aid him in this direction, the high spots of each expense account are shown in detail in Fig. 4. By this means, discrepancies in any account for any department in this plant can be immediately traced and investigated.

Actual expense against normals, Fig. 5, is a monthly report providing the superintendent with actual figures for that month. Accordingly, both expenditures and direct labor for the month are the actual figures taken off the accounting department's books as contrasted with the estimates which form the basis of the daily reports. Therefore, this report gives the actual, accurate picture of the trend of costs.

However, since the normal is an estimated value based upon an estimated volume of direct labor, normal expense for the purpose of the monthly report must be recalculated and readjusted on the basis of actual direct labor, as explained by means of Table I. Although it does not happen to be a standard form, it is introduced here as a device to show how the adjustment is made. The first line marked "basic estimates" shows the initially estimated figures for a specific problem, assuming an estimated direct labor outlay of $47,500 and a permissible normal expenditure of $32,500, which is 68.4 per cent of direct labor. Column 4 shows the non-variable normal, or fixed charge element of overhead burden, which is an actual figure to be used throughout. In the initial calculations, therefore, the difference between Column 2 and Column 4 represents the variable normal, which in this case is 55.8 per cent of direct labor. This percentage is also fixed and is used in the succeeding calculations.

Now for this same department let us assume values for actual expense as shown, they may be anything above or below the estimate, our object being solely to show how the results are interpreted. Just to illustrate the point, consider the first item of $40,000—the others being treated in exactly the same way. As indicated by the operation at the top of Column 5, the product of the fixed rate, Column 6, multiplied by direct labor dollars, gives the value of the variable normal, variable only because it changes with the actual expense. Adding Column 4 to Column 5 we get the

	1 ACTUAL Direct Labor (Dollars)	2 Col.4 & Col.5 Normal (Dollars)	3 Ratio Col.2 to Col.1 Normal Percent (Variable)	4 Fixed Charge Non-Variable Normal (Dollars)	5 Col.1 x Col.6. Variable Normal (Dollars)	6 Rate (Percent) (Fixed)
Basic Estimate	47500	32500	68.4	6000	26500	55.8
ACTUAL EXPENSE	40000	28300	70.8	6000	22300	55.8
	30000	22730	75.8	6000	16730	55.8
	50000	33900	67.8	6000	27900	55.8
	45000	31100	69.0	6000	25100	55.8
				6000		

Table I—Method of calculating variations in total normal money depending upon fluctuations in productive labor

Form No. 3476

A BRIEF ANALYSIS OF GENERAL ITEMS OF OVERHEAD

Day of_____ Plant_____

CLASS	DESCRIPTION OF ITEM	DIVISION OF EXPENSE: LABOR 100	500	700	900	MATERIAL 200	300	500	700	900

Fig. 4—Oakland's daily report sheet to superintendents showing the high spots of expense accounts for quick checking

Fig. 5—Oakland's monthly actual expense against normals gives clear picture to superintendents - - - -

Date_____

Plant_____

Actual Expenditures Against Normals

Month of_____

Productive Labor
This Month 51,366
Year to Date 1930 220,586
" " " 1929_____

	Moneys This Month		Moneys Jan.1,1930 to Date	
	Actual	Normal	Actual	Normal
100 Indirect Labor	13,063	20,360	83,547	86,059
500 Maintenance Labor	11,425	10,020	46,878	42,172
700 Losses-Errors Labor	2,773	2,419	15,892	9,888
900 Miscellaneous	488	411	2,025	1,705
Total Labor	33,745	33,230	148,342	139,884
200 Operating Supplies	2,968	2,724	13,905	11,550
300 Tools	2,025	3,869	9,813	16,029
400 Power-Light-Heat-Water	4,812	6,317	28,333	28,519
500 Maintenance Material	8,953	8,998	35,883	37,785
700 Losses-Errors Material	2,756	6,969	22,698	28,529
900 Miscellaneous Material	700	205	1,981	882
Total Material	20,220	28,982	112,613	123,292
Supt. Controllable	105.1	121.1	118.3	119.3
Sub - Total	53,965	62,212	260,955	263,176
800 Fixed Charges	22,898	21,755	82,702	87,020
Spec. Die & Tool Write-Off				
Engineering				
Re-Distributive	35,629	30,085	138,445	120,612
Mgrs. Controllable	58,527	51,840	221,147	207,632
Sub - Total				
GRAND TOTAL BURDEN	112,492	114,052	482,102	470,808

value in Column 2, representing an expense normal whose ratio to direct labor is 70.8 per cent. Obviously then, this new figure (70.8 per cent) will be used in making up the monthly report, Fig. 5, instead of the previously estimated percentage column of 68.4 per cent.

Looking at this from another angle we get a truly interesting picture. If we consider only the bare figures in Column 3, we note that with an estimated normal of say 68.4 per cent, the readjusted normal increases as the actual direct labor drops below the estimate, and decreases as the actual direct labor goes above the estimate. Off-hand we might be inclined to interpret these variations from the normal as indicating better or poorer economy. Actually, these percentages indicate unvarying efficiency, since the "variable" normal efficiency represented by the rate in Column 6 is fixed and is absolutely the same throughout.

A key to the executive control of expense is afforded by the report of actual expenditures through appropriations, Fig. 6, which shows the status of work orders and expense appropriations daily. By the very nature of things, the daily report is more or less an estimated report with percentages referred to the direct labor cost. This report is cumulative and as soon as possible after the end of the month a separate report is issued using corrected actual figures for the charges, productive labor and normal ratios. Moreover, the final report gives the ratio of the actual money spent in each burden center against its actual direct labor, rather than against the bulk direct payroll of the entire plant. The object of this report is to acquaint the management with the trend of expenses, thus enabling it to question appropriations which appear to be running over estimates. Another thing, the final monthly report balances accurately with the accounting department books.

Another detail, the control of non-productive labor cost against normals in each department is accomplished by means of a form which was shown in Fig. 1, page 576, *Automotive Industries*, April 12, 1930.

With this background of the mechanical structure of the control system, we are prepared to study the psychological considerations, which are the real stimulus

Form 3494 SC - 12-29 Corrected Report R.W.Fitch R.B.Smith

Actual Expenditures Made To Appropriations And General Work Orders Which Are Re-Classified To Manufacturing Expense

Each day and Cumulative for the month, the per cent of total expenditures to total Production labor only will be shown

This Productive labor however will be estimated and will be the same as used for the "Daily Burden Report"

As soon as possible after end of month corrected actuals both in charges and Productive money, will be shown as a "Final Corrected" report - month ending_____

This final report, will show opposite the actual money charged to each Burden Center the per cent of these charges to the Burden Center's own actual Productive labor.

This report will be cumulative thruout the year and will always show to what extent these charges have affected our Burden

Date_____

Prod. Labor 327051 1575911

BURDEN CENTERS	TO DAY	THIS MONTH	%	CUMULATIVE TO DATE	%
AXLE PLANT		989 60	2.	6405 25	2.4
FOUNDRY		3006 38	7.4	18975 12	6.2
SHEET METAL		3967 07	7.7	34503 04	11.1
PONTIAC ASSY		1930 38	4.7	3677 80	1.9
OAKLAND MOTOR		921 11	4.7	13152 34	9.4
PONTIAC "		6408 91	7.	14917 75	3.9
PAINT-TRIM-PLATE		3134 20	9.5	3465 05	2.2
GENERAL OAKLAND				397 51	.2
" PONTIAC		574 13	.2	3093 22	.3
" MOTOR PLANT		73 65	.1	1511 61	.5
ENGINEERING				1078 40	.1
POWER PLANT					
GENERAL - ALL PLANTS		1092 63	.3	7691 23	.8
TOTAL		22098 94	6.8	98772 32	6.3

Fig. 6—Key to executive control of appropriations and work orders at Oakland - -

to constant effort and improvement. First, is an elaborate suggestion system which encourages all interested persons, such as the foremen, standards department, maintenance group and the superintendents to study the details of their jobs and strive constantly for improvement. Among other things, these men watch closely such elements as standard time, manufacturing expense, usage of direct materials, etc. Suggestions are in the form of a projected or estimated saving in labor or materials, the report being in a complete form containing comparative costs, estimated savings and some notes as to the manner in which the saving is to be accomplished. These suggestions clear through the superintendent to the budget director, who has the report checked by the standards department. If the projected saving is reasonable, the credit is allowed, although it may be adjusted higher or lower, depending upon the standards department findings. Then the report is acknowledged by means of a formal letter to its originator, with copies to the management. As a final step these credits are analyzed and posted on charts, which will be described shortly.

To stimulate originality, and show how savings may be effected, regular weekly meetings are held in two different groups, one being composed of the superintendents and other executives, presided by the budget director; the other being a meeting of foremen in each plant, presided by their superintendent. At these meetings large charts showing the projected saving by departments on such items as standard time, manufacturing expense, direct materials and labor per unit are displayed. In each case the originator of an idea is asked to address the meeting and explain exactly how he expects to effect a saving and how he originated the idea.

Finally, projected savings are checked regularly to make sure that they have been effected, also to see how closely the actual figures approach original estimates. This checking operation also involves a close follow-up of each item to make sure that the saving is constantly maintained, for quite often a temporary saving is possible because of unusual conditions which the men are quick to capitalize, so as to get credit for an accomplishment which is really outside of their control.

From the point of view of direct results, this control system has proved itself to be unusually resultful. For one thing, it gives the management a clear picture of operations daily and shows the trend of costs in all phases of the operation. Overhead, the bugaboo of all management, is definitely controlled and constantly improved. But, above all, the introduction of the system, with its intelligent effort and the effect of the psychological devices employed, has produced an esprit de corps which is probably unavailable otherwise.

Wichita Produces Split Propeller-Shaft Power Take-Off Transmission

A SPLIT propeller shaft power take-off has been produced by the Wichita Falls Motor Co. of Wichita Falls, Tex. It was designed primarily for use on the trucks of the Wichita company, as many of these go into the service of oil and public utility companies and, therefore, have to be equipped with power winches and other power-driven equipment. But it has been decided to offer the power take-off also separately to other manufacturers of motor trucks and to equipment dealers.

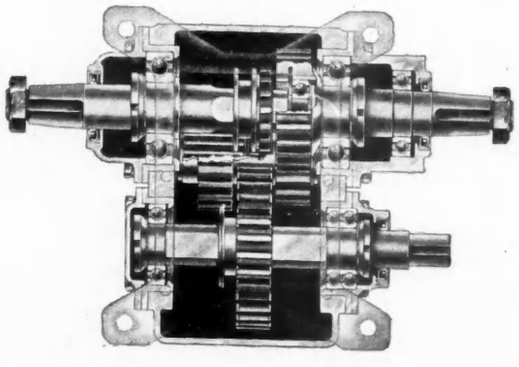
This power take-off is designed for use in trucks of up to 5 tons capacity and with engines of up to 100 hp. The gears and shafts are made of nickel-steel, while the case is cast of semi-steel. Ball and roller bearings are used throughout. The main shaft is fitted with S.A.E. 1¾-in. taper ends, the large ends of the tapers being 13½ in. apart. The power take-off shaft is 1⅝ in. in diameter, squared, with a 1¼-in. straight diameter and a 5/16 x 5/32-in. keyway.

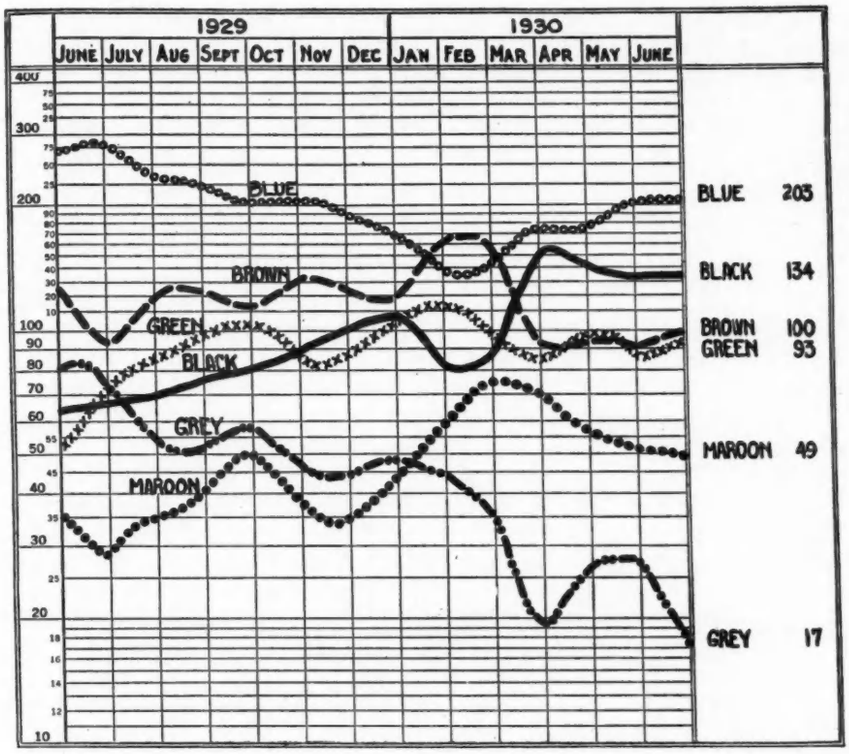
One forward and one reverse speed can be obtained from the power shaft, with a reduction of 1.37 to 1 in the direction of rotation opposite to that of the main shaft and 1.17 to 1 in the direction of main shaft rotation. The positive clutch, of the internal-external gear type, which connects the front and rear main shafts for controlling vehicle movement, operates independently of the power take-off gears, thus permitting full use of the power take-off whether the vehicle is stopped or in motion.

The parts are so designed that the unit can be assembled with the power take-off shaft on either the right or the left of the main shaft and with the sprocket end at either the front or the rear of the power take-off shaft. A double-ended sprocket shaft can be provided if desired.

A speedometer drive for Stewart-Warner installation is provided in the rear cap so that the speedometer will not be in operation except when the truck is moving.

Wichita split propeller-shaft power take-off transmission is designed as a unit for truck winches and similar equipment





Blue is still the preferred summer color for passenger cars, the Duco chart shows

BLUE FAVORED SUMMER COLOR

Black maintains its popularity, holding second place among six major passenger car finishes, survey of the Duco Advisory Service indicates

BLUE continues to hold its place as the preferred summer color in the automobile field, according to the color index just released by the Duco Color Advisory Service, New York.

Black is showing signs of resistance to a decline in favor noted during recent months and the trend away from black is believed to be checked for the present.

"An upward trend," says the index, "is noticed in the Brown group with a greyish beige of medium chroma, well in the lead for the first time since March. A clear olive hue of brown of medium strength has been elevated to the list of leaders in the brown color family."

Green has moved up from fifth to fourth position in the scale of preferred colors and is expected to increase in popularity. A decline of interest in maroon is noted. It is predicted, however, that "outstanding color values in the maroon group will stand out from time to time, particularly fine clear purple-red hues of maroon."

Grey is in somewhat exclusive place and seems most in evidence on cars of the custom-made class, a number in colors of the grey group being seen on New York streets recently.

The vogue for bright colors appears to have reached the saturation point for the present, the index shows. The current trend toward dark, serene color values, clear and rich in depth, is not peculiar to the United States alone.

A recent survey of Buenos Aires and other active South American trading areas discloses a strong preference for subdued colors in finely related sequences, such as Verona Brown with Timber Beige and Kewanee Green with Grey Olive Green.

Colors pointed to as gaining in acceptance are referred to by the index as follows: "Interlaken Blue, Haverhill Brown, Pineforest Green, Neenah Grey and Ascot Maroon are outstanding colors among the newly-popular, clear, deep values of strong distinctive chromas. Each of these shades can be effectively combined with black moldings and fenders."

This service was organized in 1925 by E. I. du

Pont de Nemours & Co. to meet the growing demands of Duco users for help in selecting suitable colors. Among the early recipients of this color advisory service were railroads, furniture, refrigerator, airplane and radio manufacturers.

Color Index

	Rank, as of June, 1930	Index, as of June, 1930	Rank, as of June, 1929	Index, as of June, 1929
Blue	1	203	1	256
Black	2	134	4	73
Brown	3	100	2	90
Green	4	93	5	64
Maroon	5	49	6	27
Grey	6	17	3	79

The color advisory work was later recognized by leading automobile manufacturers, and today many plants have divisions of color and design of their own. The exacting demands of automobile manufacturers for new colors and methods for the distribution of these colors, in order to secure the most pleasing color harmony suitable for each type of motor car model, gradually absorbed more time of the service.

When a series of new colors that are both seasonable and suitable for one or more automobile body styles, or for striping or wire wheel requirements, are determined upon, they are formulated in what is known as color sequence—each separate style color being developed by skilled colorists in the du Pont mills into three distinct variations of the same chroma so that a chromatic sequence comprised of a dark, medium and light shade of the new color is available for use by the industry. Color sequence facilitates the work of the automobile colorist; associated colors enable him to provide an element of unity in his work.

The chromatic sequence treatment has become very popular in Detroit of late, and cars are now finished in as many as four variations of the same color. A popular way of distributing color is to have the fenders, moldings and upper in the darkest shade, the body in a lighter tone, the window reveals still lighter, and the stripe and wire wheels in a very light tint of the body color.

Many Informatory Mediums

Today the Duco Color Advisory Service employs many mediums to disseminate new color combinations and color information. New Duco colors, as soon as developed, are thoroughly tested and applied to 3 x 6 in. aluminum, felt back panels. The color name and formula number of each color is stamped in black ink on the green felt back and these panels are then distributed to the different automobile factories for use by their art and color divisions, both in this country and in Europe. More than 50,000 of these small color plaques have been distributed in all parts of the world by the Duco Color Advisory Service since Sept. 1, 1929, to form a permanent record of available colors from which the manufacturer can select year in and year out.

Celluloid sheets painted with Japan colors and bound in book form, formerly in vogue as a means of exhibiting sample colors, are growing obsolete partly because of the tendency of the celluloid to discolor.

Production color figures representing the number of gallons of each color used by various automotive manufacturers are forwarded each month to the Duco Color Advisory Service where they are totaled and sent on to the Guild Business Corporation for statistical analysis. The trend of the six leading color formulas, which are blue, black, green, brown, maroon and grey, popular in the order named at this writing, is then plotted on a ratio chart by the Guild Business Corp.

The Automobile Color Index was first released in May, 1929, and has been issued regularly once a month since the first issue appeared. The Index is forwarded, when requested, to executives connected with the automotive industry. At present the circulation of the Color Index reaches 1000 copies a month.

Aircraft Engine Tests Show Major Parts Failures

(Continued from page 121)

In a general review of the various causes of a failure of aircraft engines in these official Federal type tests—a review presented to the American Society for Testing Materials, at its recent convention in Atlantic City, N. J.—Thomas T. Neill, in direct charge of the Commerce Department's aircraft engine testing laboratory, drew the following conclusions from his own personal observations in connection with the many tests run in this laboratory:

"The weaknesses which have been noted are for the most part those which should have been found and corrected during the manufacturers' development work. All of the engines submitted are supposedly ready for production and sale. Yet, out of the first 12 engines tested, only two passed. The builders of the others either resumed their experimental work or discontinued activity in this line. The protection afforded the flying public, as well as those over whom these engines might have flown, is very obvious.

"This test work has also resulted in the building of improved commercial engines, thus helping the manufacturers to create new public confidence in the industry. Most of the engines recently submitted have passed the tests, whereas formerly the reverse was true, even though the test requirements have gradually been made more rigid.

"The best engines must not be abused. Those which have received Approved Type Certificates from the Department of Commerce, as listed in the Air Commerce Bulletins, are approved for certain speeds—and for use with fuels the anti-knock properties of which should be at least equal to certain values. If these conditions are not fairly met, new failures not encountered on the test stand may be expected."

HOW'S BUSINESS?
GOING TO BE NEXT MONTH

CHARTED BY UNITED BUSINESS PUBLISHERS, Inc.

THIRTY-FOUR ECONOMIC EXPERTS—EDITORS OF BUSINESS PAPERS PUBLISHED BY THE *United Business Publishers, Inc.* —HERE PRESENT A COMBINED OPINION ABOUT THE COURSE OF BUSINESS DURING THE MONTH OF AUGUST. GOVERNMENT AND OTHER RECORDS PROVIDE YOU WITH HISTORY OF RECENT MONTHS. THIS BOARD OF EXPERTS DEALS ONLY WITH THE FUTURE. ITS OPINIONS ARE BASED ON CLOSE CONTACT WITH THE MORE THAN 400,000 SUBSCRIBERS REACHED BY THEIR PUBLICATIONS IN FAR-FLUNG FIELDS OF RETAILING AND INDUSTRY.

Further curtailment of wages and income is reflected in a general weakening of retail prices. Trade, which has held up much better than production, is now responding to the lowered demand of summer months.

The tariff sore, although it may leave a scar, is healing; and there is a ray of hope in the transition from the rather destructive optimism in the early months of the year to the more constructive pessimism that has taken its place, and which, it is believed, marks the beginning of a recovery.

Recession, which began to show definite tendencies downward early in August, 1929, is apparently, after a full year, close to or actually at the bottom of the depression.

Labor Day, which quite definitely marks the end of the summer season in many sections and tends to concentrate attention on fall needs, falls on September 1st. Arriving at this pivotal point, it is hoped that business will gradually rise from its present prone position to a sitting posture, and rapidly regain its feet and stride as the fall season advances.

THE COURSE OF BUSINESS FORECAST FOR NEXT MONTH

BUSINESS	SALES	RETAIL STOCKS	COLLECTIONS	COMMENTS
AUTOMOTIVE	Small seasonal decline on passenger cars, with sales about 25% less than Aug. '29. Trucks about 10% less in August than in July, and about 20% under Aug. '29.	There will be no material change in retail stocks of either passenger cars or trucks, which in both cases will be much lighter than Aug. '29.	Collections will be about the same in August as in July, passenger cars being somewhat slower than Aug. '29, and truck collections considerably slower.	New developments in medium-priced passenger cars expected to stimulate sales. Low-priced light trucks selling far ahead of any year previous to 1929.
DEPARTMENT STORES	Sales will be approximately the same in August as in July, but about 6% under Aug. '29.	About the same in August as in July, but 8% less than in Aug. '29.	There will be little change in collections in August, which will continue noticeably slower than Aug. 29.	Adjustment of store expenses to sales volume is being made satisfactorily.
HARDWARE	Slightly better in August than in July, but about 4% under Aug. '29.	Retail stocks will be lighter in August than in July, and noticeably lighter than in Aug. '29.	Will show little change between July and August, but somewhat lighter than Aug. '29.	Considerable optimism in the trade as to prospects of better business in the fall.
INSURANCE	Life insurance lower, fire and casualty steady as compared to July. All lines slightly better than Aug. '29.		No noticeable change in any line. Accounts being watched more closely this year and should show improvement over Aug. '29.	Present prominence given to unemployment problems fostering a demand for group insurance that is being capitalized by many companies.
JEWELRY	Somewhat less in East and Middle West, with anticipated improvement in Far West and on Pacific Coast as compared to July, and 5% to 20% lower than Aug. '29.	The same or slightly less than in July, and much less than Aug. '29.	Slightly slower, except on the Pacific Coast, where they are expected to be better. Generally slower than in Aug. '29.	Silver trade nearer normal in August than any other line, watches next. Diamond stocks increasing, but much less than Aug. '29.
LUMBER	No prospects of improvement in August sales over July, and considerably lower than Aug. '29.	August will continue to show low inventories.		Better control of production now characterizes the entire industry.
MACHINERY METAL PRODUCTS METALS	Steel production about 5% greater in August than in July, but about 25% to 30% below Aug. '29.	July and August traditionally dull months in machine tool trade. Signs of betterment not expected before fall.		Machinery demand dull, except in special fields. Exports for first five months largest ever recorded in that period.
PETROLEUM	Estimated daily consumption of gasoline, 1,278,900 bbl., an increase of 3.4% over July and 5% increase over Aug. '29.	Estimated on Aug. 31, 43,000,000 bbl., decrease of 8.9% from July, and increase of 27.2% from Aug. '29.		Gasoline consumption at annual peak in August, which should help to reduce excessive inventories overburdening the market.
SHOES	Clearance sales summer shoes declining. Greater clearance sales effort this year, more pairs sold, fewer dollars.	Reduction of dealer stocks will continue, bringing them perceptibly lower than Aug. '29.	Improvement anticipated, as dealers have had good summer business. Public is slow pay, and on charge accounts much slower.	Upward trend developed in the Boston shoe market early in July holds promise for a favorable fall.

Four Eights Comprise Buick's 1931 Line

(*Continued from page 117*)

type, and counterweighted. Cast-iron pistons are retained.

Dual manifolding has been adopted on the two larger engines, the 8-60, 8-90, with dual Marvel carburetors, which latter have only a single adjustment.

Manufacture of the automatic radiator shutters for the new Buicks has been taken over by the Harrison Radiator Co. Improvements in the cooling system include the mounting of the shutter-controlling thermostat directly in the water in the top header tank of the radiator, for more accurate control, and the attachment of the radiator assembly to the frame through the shell rather than the core, relieving the latter of strains.

Four-Point Rubber Mounting

Four-point rubber mounting is now used, in contrast to the three-point mounting of the sixes. At the front the mounting is on rubber shims, while tension-type bonded rubber-metal assemblies are employed at the rear.

Torque-tube drive is retained on the three larger chassis, but Hotchkiss drive is used on the Series 8-50, as was the case on the Marquette. Rear axle housings are now one-piece stampings of full banjo type, resulting in reduced unsprung weight and improved riding qualities. To further improve the riding qualities certain changes have been made in the springing, etc. Rear springs have more travel and front springs have been increased in length, while the double-acting shock absorbers, of Delco-Remy manufacture, have been redesigned, with opposed cylinders and lighter action. They are also relocated in the frame in such a manner as to apply the stresses to the side rails nearer points reinforced by cross-members. Shock absorber links are carried in oilless bushings mounted in rubber.

Front axle I-beams have been increased approximately 10 per cent in stiffness. Frames have been completely redesigned, and cross-members increased in size. A large box section member at the center and the use of four-point engine mounting strengthens the frame materially.

Emergency shoes have been eliminated and all brakes are now applied by either pedal or hand lever. This means a cleaner brake hook-up and simplified adjustment. Cable controls are used on the front brakes.

Wheels on all the new Buicks are balanced in assembly and are designed so that they can be rebalanced following a tire change.

Although the bodies appear to be unchanged, they have been improved structurally to prevent squeaks and rattles. Thus the slatted roof is now bolted to the roof side rails with metal brackets. Cowl and windshield pillars now form a single stamping, including the molding on the cowl, which formerly was of the applied type. Rear body panels are now also in one piece. Brackets are heavier, especially at the usual points of weakness of the car as a whole. Door stops have been removed from the top of the doors and placed in the center of the pillar. The gear-shift lever has been moved forward onto the bell housing for more front compartment room. The frame and adjusting mechanism of the front seat have been lowered to make room for deeper cushions. Instrument boards are new in appearance, the panel being finished to represent grained wood. Both direct and indirect lighting is provided.

Standard equipment on all closed bodies includes VV sloping windshields with external visors, screened cowl ventilators, adjustable front seats, new type rear vision mirror with rounded ends, dash gas gage, engine thermometer, etc. On cars with fender well mounting of spare wheels, metal tire covers finished in colors to harmonize with the body are furnished as special equipment. Other special equipment includes heaters, Delco-Remy radio and clocks. Gravel deflectors are furnished with fender well equipment.

Rear windows on special coupe models can be lowered for ventilation. Ash receivers are furnished in the doors of all coupes except those on the 80 and 90 series chassis, which have combination vanity and smoking sets.

May Raise Lithium to Commercial Status

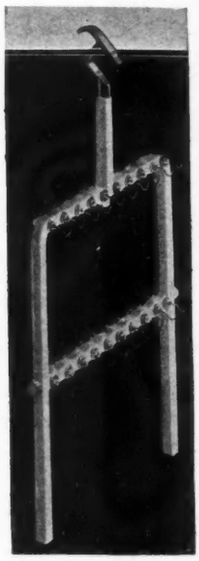
DURING the past few months there has been some talk of raising lithium, the lightest of all metallic elements, to the status of a commercial metal. A writer in *Automobiltechnische Zeitschrift* says it has been the common experience that whenever engineering has found uses for certain materials it has been possible to develop commercially practicable production methods, and he points out that whereas in 1913 lithium still sold at a price comparable with that of gold, it is now down to the level of silver.

Lithium, which was first isolated by the German chemist Kirhhoff in 1855, is present in many mineral waters which are beneficial in cases of rheumatism and similar ailments. Metallic lithium is produced from such minerals as amblygonite and petalite, which generally contain only about 1 per cent of the metal. From these minerals lithium chloride is produced by rather complicated chemical processes from which metallic lithium is produced by electrolysis.

Lithium is a silver-white metal which readily oxidizes in contact with the air. It has the lowest atomic weight of all metallic elements, viz., 6.94, and its specific gravity is only 0.53. The metal is poured in rods of ¼ in. diameter, which are packed in air-tight lead tubes, in which form it is sold. The purity of the commercial metal ranges between 98 and 99 per cent.

New Automotive Developments

Crown Rubber Covered Plating Racks



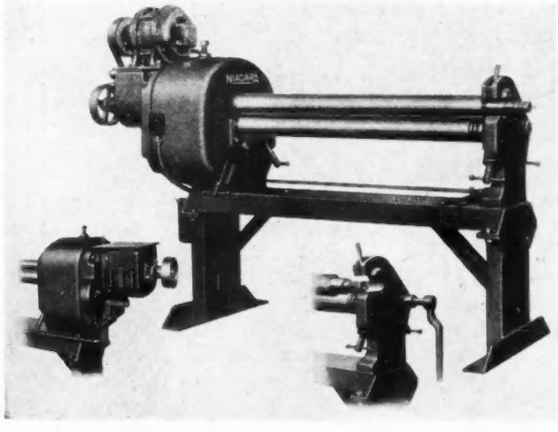
SOLID, soft-rubber covered plating racks built up from standard rods ⅜ in. sq. with a carrying capacity of 100 amp. have been placed on the market by the Crown Rheostat & Supply Co., Chicago, Ill.

This is a solid, soft red rubber-covered rack, of one piece construction for each straight spine. There are no seams, except at the joints—and these are tightly sealed, and no soldered joints. Another feature is the direct connection of the hooks with the spine—each hook being seated and sealed with a rubber washer, and made easily removable for replacement.

Niagara Slip Roll for Forming Sheet Metal

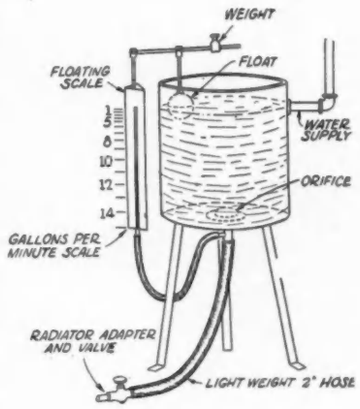
A FOUR-IN. diameter roll for forming sheet metal cylinders has been added by The Niagara Machine & Tool Works, Buffalo, N. Y. Adjustment of the lower front and real rolls is accomplished through vise handled screws without use of wrenches. A compact unit, self-contained and entirely enclosed, can be readily applied to the Nos. 349, 351 and 353 hand operated forming rolls to operate them by power. A 2 hp., 1500-1800 r.p.m. motor is required.

Operators work at the handle end of the machine entirely. The top roll does not have to be lifted to remove the finished work as it is pivoted at the left-hand end and swings forward to permit sliding the work off the roll. It is locked in the operating position by a quick releasing mechanism. Three lengths of rolls are available, 36 in., 48 in. and 60 in. They can be furnished for either hand operation, pulley drive, or belted motor drive.



Meriam Flow Meter for Radiator Testing

A SIMPLE device for testing radiators with regard to flow conditions has been placed on the market by The Meriam Company, Cleveland, Ohio. It consists of a 110-gal. tank, a Meriam floating flow-meter, and a very flexible 2-in. hose-pipe for connecting up to the radiator to be tested by means of a slip-on adapter. The valve for the control of the water flow is a simple and light aluminum screw clamp which collapses the hose against a rubber saddle vulcanized to the inside of the control point.



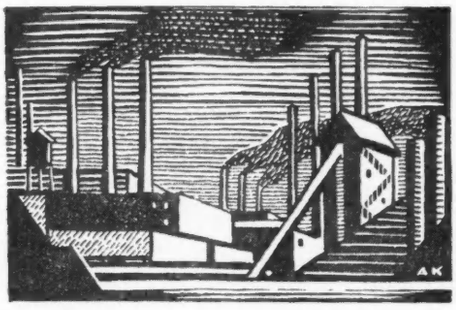
A discharge orifice is provided in the bottom of the tank, and a small rubber pipe connects from the outlet side of this orifice to a flow-indicating tube. This latter and its 5-ft. plainly marked scale are mounted on a float in the tank itself. By this method, the height of the water in the glass tube will always slow the correct flow in gallons per minute regardless of the water level in the tank. An ordinary closet valve connected to the water supply refills the tank after use.

Straight-side Power Press

UP to thirty strokes per minute with a capacity of 250 tons are provided by the No. 6-19 straight-side power presses of built-up tie rod construction recently added by the Zeh & Habermann Co., Newark, N. J. Among the features of this press are: central lubrication; brake adjustment from the operator's station, and free access to the jaw clutch. The large driving gear is located close to the frame, thus eliminating the outboard bearing.

Automotive Oddities—By Pete Keenan

AMOS N' ANDY'S FRESH AIR TAXI CAB CO., IS A FULL MEMBER OF THE NATIONAL ASSOCIATION OF TAXI CAB OWNERS.
A FRENCH ENGINEER HAS INVENTED A LOUD-SPEAKER TO REPLACE THE MOTOR HORN. Paris, 1930.
COME ON DUMBELL
FRITZ SCHINDLER HAS A CONTRACT REQUIRING HIM TO GO ALOFT FOR CIRCUS STUNTS DAILY, RAIN OR SHINE. Berlin, Germany.
THERE ARE ENOUGH AUTOMOBILES IN THE U.S.A. TO PERMIT THE WHOLE POPULATION TO GO FOR A RIDE SIMULTANEOUSLY.
JOE HAUSER CAUGHT A BATTED BALL THAT PASSED COMPLETELY THROUGH THE OPEN WINDOWS OF A SEDAN. THE BATTER WAS OUT.
Fort Worth, Texas. 1926. (Sent in by H. Stevenson, Newspaper Reporter).



NEWS OF THE INDUSTRY

Glenn H. Curtiss Dies in Buffalo

Aviation Pioneer Served the Industry In Many Capacities

BUFFALO, July 23—Glenn H. Curtiss, aviation pioneer, died early today in the Buffalo General Hospital, following an operation for appendicitis on July 11.

He was born in Hammondsport, N. Y., on May 21, 1878, son of Frank R. and Lua Andrews Curtiss, and received his education in the public schools, doing odd jobs between times. His father died when he was a boy and young Curtiss went to work as a telegraph messenger. When he was 14 the family moved to Rochester and the future aviator was employed by the Eastman Kodak Co.

His greatest triumph to that time came on May 29, 1910, when he flew from Albany to New York, thereby becoming the first man to follow the Hudson River as an aerial highway, as well as the first to fly between the two cities. Twenty years later, on the same date, the event was commemorated with Curtiss piloting one of his own giant 18-passenger twin-motored Curtiss-Condor biplanes over the same route.

In 1909 Curtiss gave the first exhibition flight in America at New York and won *The Scientific American* trophy for the second time with a flight of 24.7 miles at Hempstead Plains, L. I. Soon after he won the Bishop Prize for a flight of a kilometer in two and a half minutes. This led to his selection by the Aero Club of America to represent this country at the aviation meet at Rheims, France, for the James Gordon Bennett Cup. He won the cup, defeating

(Continued on page 138)

Ford Extends Shutdown

DETROIT, July 23 — Ford Motor Co. announced today that its vacation period would be extended one week, and instructions have been issued to employees to return to work Aug. 4, instead of July 28, as previously announced. Plant and offices were closed July 11 for the two-week vacation period.

Reliance Purchases Cole

COUNCIL BLUFFS, IOWA, July 29 —The Reliance Battery Products Co. has purchased the Cole Battery Corp., of Chicago. The Reliance company has capacity of 1200 batteries daily, and the Cole plant 1200 batteries.

Hupp Earnings Drop In Second Quarter

DETROIT, July 23—Hupp Motor Car Corp. has reported net profit for the quarter ended June 30, 1930, of $442,-304 after charges and taxes equal to 29 cents a share (par $10) earned on 1,512,092 shares of capital stock. This compares with profit of $66,749, or 4 cents a share, in the preceding quarter and $1,329,787, or 95 cents a share, on 1,400,122 shares in the second quarter of 1929.

Net profit for six months ended June 30, 1930, amounted to $509,053 after above charges equal to 33 cents a share earned on 1,512,092 shares, which compares with $2,831,383, or $2.02 a share, on 1,400,122 shares in the first half of 1929. Current assets on June 30, 1930, totaled $20,258,866 against current liabilities of $4,979,096.

Hudson Earns 67c a Share

DETROIT, July 22 — The Hudson Motor Car Co. reports a net profit of $1,075.067 for the quarter ended June 30, 1930. This is equal to 67 cents a share, and compared with a net income of $2,316,945, or $1.45 a share in the preceding quarter, and with $6,053,729 or $3.79 a share in the second quarter of last year. Net earnings for the first six months of 1930 totaled $3,392,012, or $2.12 a share, as compared with $10,621.512, or $6.55 a share in the first half of 1929.

Ask Aero Conference

NEW YORK, July 23—The Board of Governors of the Aeronautical Chamber of Commerce of America, Inc., today passed a resolution requesting the Department of Commerce to call a national conference of official representatives from the 48 states to consider with Federal officials and with representatives of the industry questions pertaining to government legislation in encouraging their regulation of aviation.

Net Profit Drops For General Motors

Corporation Earns $2.15 a Share on Common for First Half

NEW YORK, July 23—General Motors Corp. reports net operating profit for the first half of the current year of $98,355,355. This is equivalent to $2.15 per share on common stock after preferred dividends and compares with earnings of $151,860,310, or $3.38 a share, for the first half of 1929.

There was during the second quarter an item of non-operating, non-recurring profit resulting from the sale of 1,375,000 shares of common stock to General Motors Management Corp. and amounting to $9,517,943. This brings total earnings for the first six months to $105,932,428, or $2.32 a share, on common stock.

Operating profit for the June quarter, including equities in the undivided profits of subsidiary and affiliated companies not consolidated, was $53,-386,768. This is equivalent to $1.17 a share after preferred dividends and compares with profit for the corresponding quarter of last year of $89,949,323, or $2.01 a share.

In commenting on these earnings, Alfred P. Sloan, Jr., president, states that the corporation's percentage of total automotive business, as measured both by units and in dollar volume, has been well maintained. He further points out that the relation of earnings to volume, in comparison with previous years, is exceedingly favorable in view of the fact that a fall-off in volume is normally accompanied by a much greater reduction in profits because of the influence of fixed or uncontrolled expenses which must go on to an important degree irrespective of conditions.

Dealer's President Resigns

CHICAGO, July 24—The resignation of J. R. Histed, president of the National Automobile Dealers Association, has been announced by the board of directors of the association. George D. Wray, Shreveport, La., is acting president of the association until a successor is named.

Glenn H. Curtiss Dies in Buffalo Hospital; Pioneered Many Developments in Aviation

(Continued from page 137)

Bleriot, who was the first to fly the English Channel.

When the motorcycle appeared on the market young Curtiss took an active interest from the very beginning in the new machine. He started manufacturing the motor, then proceeded to make the whole machine. Soon the Curtiss motorcycle became the best known machine of its time, carrying off most of the prizes. On Jan. 28, 1904, at Ormond Beach, Fla., Curtiss covered the 10-mile course in 8 minutes 54 2/5 seconds, creating a record which stood for 16 years. Two years later, riding an eight-cylinder motorcycle of his own design, he roared down a mile course at Ormond Beach at the rate of 137 m.p.h., a record that stood for about 20 years.

In his racing days in Florida, Curtiss met Alexander Graham Bell, inventor of the telephone and aviation enthusiast. A friendship was formed between the two which led to the organization, in 1907, of the Aerial Experiment Association, for the purpose of building a heavier-than-air machine capable of carrying a man. Though they had made their first flight in 1903, the Wrights at that time had not yet flown publicly, as they were still waiting for their patents.

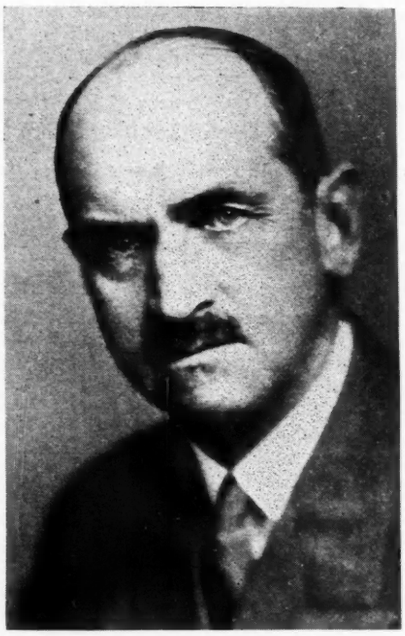
With the assistance of Dr. Bell, and a gift of $25,000 from Mrs. Bell, a group of young men, consisting of Curtiss and four others, started experimenting. They took seven months to design their first plane, seven weeks to build it, and 20 seconds to "crack it up." But in those 20 seconds the Red Wing, as they had christened their ship, had flown for a distance of 318 ft. 11 in. It was the first public flight in America.

On May 22, 1908, Curtiss took off in his second machine, the White Wing, flew it for a distance of 1017 ft. in 19 seconds, and landed safely in a plowed field. It was at this time that he developed the ailerons for horizontal control, a device which involved him in a long drawn out litigation with the Wright brothers, who had used warped wings for the same purpose.

On July 4, 1908, flying in the now historic June Bug, Curtiss won *The Scientific American* trophy by covering a distance of a kilometer. It was the first previously announced flight to be made in America. Huge crowds came from miles around to see the latest wonder.

A few personal tributes to Mr. Curtiss, out of the many reported by the newspapers, follow:

Charles L. Lawrance, vice-president,



Glenn H. Curtiss

Curtiss-Wright Corporation, in charge of engineering and research said:—Glenn H. Curtiss was one of the outstanding figures in the creation of American aeronautics. His first interest was in aircraft engines, and it is fair to say that through his efforts in the engine field, he made possible the early development of flying in the United States.

C. M. Keys, president of Curtiss-Wright Corporation, said:—The death of Mr. Curtiss removes one of the great original minds in aviation. It is, however, as a personal friend that I shall miss him most. It is nearly 10 years since he retired from active work in this field of aviation, but always his friendly advice and criticism had been most helpful to all of us in the Curtiss Company.

June Output Was 335,475 Vehicles

Final U. S. Figures of Department of Commerce

WASHINGTON, July 24—June production (factory sales) of motor vehicles in the United States, as reported to the Department of Commerce, was 335,475, of which 289,245 were passenger cars, 45,771 trucks, and 459 taxicabs, as compared with 417,406 passenger cars, trucks and taxicabs in May, 545,932 in June, 1929; 396,796 in June, 1928, and 323,817 in June, 1927.

Canadian production reached a total of 15,685 vehicles for the month of June, according to the Dominion Bureau of Statistics. Of this number 12,194 were passenger cars and 2896 were trucks. Total May production in Canada set a record for this year with 24,672 units.

Motor Wheel Earns $1.15 a Share

DETROIT, July 24—Motor Wheel Corp. reports net earnings for the 6 months ended June 30, of $980,607 after taxes equal to $1.15 a share on 850,000 shares outstanding or equal to $1.43 per share on 687,500 shares outstanding June 30 last year. Earnings for the first 6 months of last year were $2,432,998 equal to $3.54 a share on shares outstanding then or $2.84 a share on the shares outstanding June 30 this year.

June Sales Off 33 Per Cent

PHILADELPHIA, July 24 — June registrations of new passenger cars were 33 per cent behind the same month last year in the 23 states and the District of Columbia for which figures are available. On this basis, for the United States, registrations totaled 260,000 last month as compared with 386,000 in June, 1929.

De Soto Adds 674 Dealers

DETROIT, July 23—The De Soto Motor Corp. has announced the addition of 674 new dealers during the first six months of 1930.

Financial Notes

United Engineering and Foundry Co. declared its usual extra dividend disbursement of 35 cents in addition to the regular quarterly dividend.

H. H. Franklin Mfg. Co. has declared regular quarterly dividend of $1.75 on preferred, payable Aug. 1, to stockholders of record July 20.

Bohn Aluminum & Brass Corp. reports net profit for first six months this year $688,766 after all charge and Federal taxes, equal to $1.95 on 352,418 no par shares. This compares with net of $1,781,579 or $5.08 share on 350,831 shares first half last year. Sales first half this year $9,579,208 compared with $21,071,808 first half last year.

Cadillac Takes Birmingham Outlet

BIRMINGHAM, July 21 — The Drennen Motor Car Co., for 22 years in the automobile business, announces that a factory branch of General Motors will soon take over its agency for Cadillacs and LaSalle cars. Drennen will continue to handle Buicks.

Hoenigmann Leaves Moline

MOLINE, ILL., July 24—Frank J. Hoenigmann, for the past 4 years general superintendent of the Moline, Ill., branch of the Minneapolis-Moline Power Implement Co., resigned his position after 10 years association with that company and its predecessor.

Equipment Index Drop During June

Follows Seasonal Cut in Automobile Output

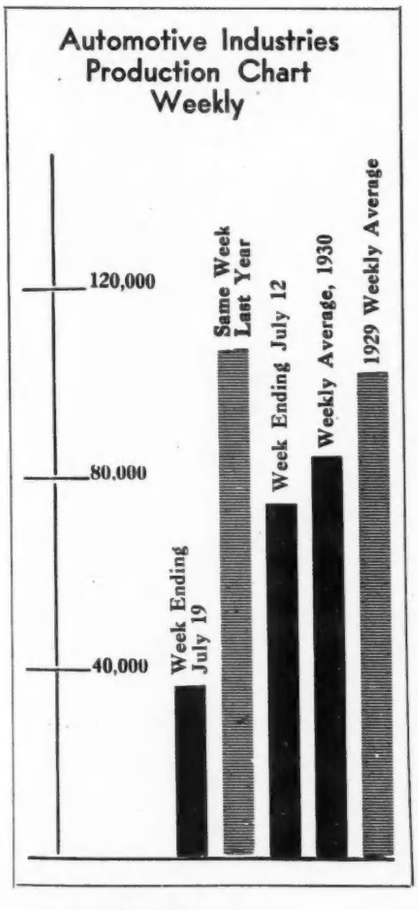
NEW YORK, July 23—Manufacturers of parts and equipment for the automotive industry suffered a decrease in volume of business during June, resulting from the general economic trend, according to the index figures prepared by the Motor & Equipment Association.

Following a seasonal reduction in car manufacture, original equipment index was 119, on the basis of January, 1925, as 100, which compares with 153 for May and with 231 for June of last year.

The index for service parts was 131 for June as compared with 137 in May and with 150 in June of a year ago. This decline from May is indicated as less than a normal seasonal decline and is attributed to the fact that service stations are stressing the need to keep the old car in good operating condition. Accessory index for the month is 71 as compared with 78 in May and with 90 in June of last year.

Le Baron Gets Packard Order

CHICAGO, July 22 — The Le Baron division of the Briggs Mfg. Co. has received a substantial order for convertible type custom-built bodies from the Packard Motor Co.



Pines Has Large Bookings

CHICAGO, July 24 — Pines Winterfront Co. now has dealer orders on hand for more than 67,000 detachable winterfronts, J. F. Raleigh, president, said today. This represents a substantial increase over dealer orders to date last year.

Freight Rates Revised

NEW YORK, July 23—Considerably lower rates on automobile shipments to points in Western Trunk Line territory beyond the Mississippi River and as far west as the Rocky Mountains are indicated, while rates to points east of the Mississippi River and north of the Ohio River are advanced about 10 per cent, by two sweeping decisions that have just been released by the Interstate Commerce Commission, as reported to the National Automobile Chamber of Commerce.

Durant Moves 2 Departments

LANSING, July 22—Engineering and purchasing departments of Durant Motors, Inc., will be moved from Detroit to Lansing on Aug. 1, Ralph A. Vail, vice-president of Durant, announced Monday.

Executive offices of Durant have already been moved here and when the two additional departments are transferred Durant will have completed its program of centralization in this city.

Durant Reduces Payroll

LANSING, July 22—A 50 per cent reduction in number of employees in all departments from sales to shipping was announced by Durant Monday. The plant has been running with a steady employment since the first of the year, but because of the lull in summer business it has become necessary to make drastic reductions. Production was resumed Monday after a two weeks' shutdown.

AC Replacement Sales Gain

DETROIT, July 24—During the first six months of this year sales of AC spark plugs for replacement use were greater than during the same period last year, while sales of the company's products to car manufacturers were 85 per cent of those in the first half of 1929, according to Harlow H. Curtice, president and general manager of the AC Spark Plug Co.

Bendix Gets Decision

CHICAGO, July 22 — Damages of $261,511, together with costs, have been awarded the Stromberg Motor Devices Co., a subsidiary of the Bendix Aviation Corp., in its suit against receivers of a former competitor for patent infringement. The decision was rendered by the Circuit Court of Appeals and marks the end of litigation that has lasted 16 years.

Henninger Buys Gear Interests from Durant

New Process, Warner Corp. and Adams Axle Passes Into Syracuse Ownership

SYRACUSE, N. Y., July 22 — Anthony A. Henninger, president and for five years general manager of the New Process Gear Co., Inc., and associates, have bought the company together with the Adams Axle Co., Inc., and the Warner Corp., Muncie, Ind., from W. C. Durant and Durant Motors, Inc. The purchase price was $6,000,000.

A. A. Henninger

The new group, which will be controlled by the Syracuse Gear Co., a Delaware corporation, is said to be the largest independent differential gear manufacturers in the world.

This shift from control by automobile manufacturing interests to an independent organization will enable the new company to expand its scope of business, according to Mr. Henninger. The properties include 15 acres of unimproved land along railroad sidings and about eight acres of manufacturing floor space.

Directors of the Syracuse Gear Corp. serving with Mr. Henninger are Willis H. Michell, attorney; C. Hamilton Sanford, president, Syracuse Trust Co.; William T. McCaffrey, president, Lincoln National Bank & Trust Co., and C. R. Stever, treasurer of the new corporation.

The New Process Gear Co. was founded by Syracuse interests to manufacture raw hide gears. The company passed into the hands of John N. Willys. Later it was bought from receivership by Durant Motors, Inc., the control being exercised by Mr. Durant.

The Adams Axle Co. plant was moved from Findlay, Ohio, in 1924, and now adjoins the New Process plant in Syracuse.

The Warner Corp., Muncie, Ind., and the Adams Axle property have been operated by Mr. Henninger, together with the New Process factory.

Vlchek Appoints Cody

CLEVELAND, July 24 — Announcement has just been made by Frank J. Vlchek, president of the Vlchek Tool Co., of the appointment of W. H. Cody to the position of general sales manager of the company.

Standard Appoints Devos

JERSEY CITY, July 21—Standard Motor Construction Co., Jersey City, has appointed L. S. Devos as general sales manager.

Men of the Industry

Curtiss-Wright Names Hughes

Earl E. Hughes has been appointed advertising manager and sales promotion chief for the Curtiss-Wright Corp. and its subsidiaries. Mr. Hughes is an engineer and has served in promotion work for the Westinghouse Electrical & Mfg. Co., Chesapeake Electric Co., Vacuette Sales Corp. and Hoosier Investment Corp.

During the past two years he has organized for the Wright Aeronautical Corp. a program of sales research, statistics and a campaign of advertising and sales promotion.

Reo Names Oldfield

Barney J. Oldfield has been named Reo's new regional manager for the Southwest, according to an announcement by Elijah G. Poxson, general sales manager, Reo Motor Car Co. Mr. Oldfield started in the industry with Ford, serving five years as district organizer. For more than seven years he was with Willys-Overland as retail salesman, district representative and zone supervisor. After becoming a district manager for Hupp, he became special representative in the South for Federal Motor Truck.

Reo Appoints Kalmbach

Carl M. Kalmbach, formerly superintendent of planning for the Chrysler Corp., has been appointed production manager of the Reo Motor Car Co. Mr. Kalmbach spent several years in the production and purchasing departments of the Ford Motor Co. Later he became director of purchases for Wills-St. Clair. As superintendent of planning for Chrysler he reorganized the Jefferson Avenue plant in Detroit. At a later time he became a Dodge dealer.

Zweiner on Leave

Wallace Zweiner, secretary and comptroller of Durant Motors, Inc., is on a leave of absence according to an announcement made yesterday by R. A. Vail, vice-president. Mr. Zweiner, it was explained, is now on a trip to the Pacific Coast in an endeavor to improve his health.

Dodge Assigns Three

W. W. Hargis, C. G. Hall and George W. Gaidzik, formerly factory sales development specialists for Dodge Bros. Corp., are delegated to new field merchandising posts, according to an announcement.

Mr. Case supervises sales operations in the Detroit, St. Louis, Memphis, Kansas City, Oklahoma City, Dallas and San Francisco territory; Mr. Åkers in the Boston, New York, Philadelphia, Pittsburgh, Washington, Charlotte, Columbus and Atlanta territory, and Mr. Stanton in Chicago, Indianapolis, Louisville, Des Moines, Omaha, Denver, Minneapolis and Portland.

Federal Appoints Hanna

Scott C. Hanna has been appointed manager of the northwest branch of the Federal Truck Co. He succeeds H. E. Steinbrink, who has gone to Philadelphia. Mr. Hanna has been branch manager for the Graham-Paige Co. in Omaha, Neb.

Olds Appoints Lesher

The appointment of Russell D. Lesher as manager of the Oldsmobile-Viking Cleveland zone was announced today by J. T. Collins, general sales manager of Olds Motor Works, Lansing, Michigan.

Reichard Returns to U. S.

E. L. Reichard, export manager of the LaFrance-Republic Corporation, Alma, Mich., has just returned from a four months' trip through all of the principal cities of Cuba, Mexico, Central and South America.

M.E.A. Develops Own Show Plans

NEW YORK, July 22—Final arrangements for the fourteenth annual show and convention of the Motor & Equipment Association, to be held in Cleveland, Nov. 10-14 inclusive, will be actively developed in the immediate future following the action of the Executive Committee at a special meeting held at the Hotel Cleveland on July 18.

This action followed the collapse of negotiations with the National Standard Parts Association when the board of directors of that association voted against the M.E.A. proposal for a joint show.

Chrysler Shifts Two

The transfer of Jean Falk, former manager of the Detroit district, to a similar capacity in the Boston district, has been announced by the Chrysler Sales Corp. Mr. Falk succeeds L. F. Harris, who resigned to take over the Chrysler distributorship in Worcester, Mass. B. A. Rupprecht, who has been doing special work for the Chrysler Corp. and was formerly Plymouth regional manager in Chicago, succeeds Mr. Falk as manager of the Detroit district. All changes are effective immediately.

Goodrich Shifts Exports

KITCHENER, ONT., July 17—A major part of the export business of the Goodrich Tire & Rubber Co. will be transferred from the company's international plant at present located in New York to Kitchener, Ont., it was announced by J. D. Tew, president, on a recent visit to the Canadian factory at Kitchener, Ont., where he conferred with D. L. Sargeant, Canadian manager.

International Gets Soviet Order

CHICAGO, July 21—An order from the Soviet Government, through Amtorg Trading Corp., for a large number of tractors has been received by the International Harvester Co. Manufacture will begin at once. Company officials did not disclose the number of tractors involved.

Kissel-Ruxton on Line Soon

HARTFORD, WIS., July 21—Production of a new front-wheel drive car will be under way soon at the plant of the Kissel Motor Co. here. The car will be known as the Kissel-Ruxton.

Appleton Plans Addition

CHICAGO, July 21—Appleton Electric Co. is erecting a two-story addition to its Wellington Avenue plant. The structure, which is to be 90 by 90 ft. will connect two units of the present factory.

Marmon Field Men Meet

INDIANAPOLIS, July 24—Marmon Motor Car Co. production and sales plans for the remainder of the year and for the opening of 1931 were gone over at a meeting of Marmon field men here during three days of this week. Optimistic forecasts were brought by nearly all the field men, according to George C. Tenney, general sales director, who was in charge of the meeting. Tenney said that the reports indicated that general business could expect an upturn early in the fall with the motor industry following shortly with volumes reaching satisfactory totals by the end of the present year.

Plans Separate Parts Show

DETROIT, July 22 — The board of directors of the National Standard Parts Association at its mid-summer meeting in Cleveland, July 17-18, voted in favor of the N.S.P.A. holding its own separate show in 1930. Negotiations had been pending between the N.S.P.A. and the Motor & Equipment Association for a combined show next November, comprising the manufacturer members of the two associations.

U. S. Rubber to Concentrate

NEW YORK, July 21—United States Rubber Co. will consolidate all its mechanical goods manufacturing at the plant at Passaic, N. J., according to announcement made by F. B. Davis, Jr., chairman of the board and president of the company. This step is taken in conformity with the company's plan announced some time ago of consolidating all its various activities as closely as possible. At the time of the original announcement, the tire manufacturing activities of the company were all transferred from the various points and centralized at Detroit.

Plan Production Session

NEW YORK, July 21—Plans for the annual production session of the Society of Automotive Engineers, to be held in Detroit, Oct. 7 and 8, have been announced by the meetings committee of the production activity group of the society. Arrangements for the production dinner, Oct. 8, Book-Cadillac Hotel, are being made by Phil Kent, chairman of the Detroit section.

Speakers will be R. L. Templin, Aluminum Co. of America; W. H. McCoy, General Motors Corp. Research Laboratories; J. C. Hough, Matthews Conveyor Co.; E. J. Bryant, Greenfield Tap & Die Corp.; Paul N. Lehoczky, Ohio State University, and C. B. Jones, Detroit School of Applied Science, according to Joseph Geschelin, associate engineering editor, *Automotive Industries*, chairman of the meetings committee.

Several trips will be made to manufacturing plants.

Yellow Truck Reports Profit

NEW YORK, July 22—Yellow Truck & Coach Mfg. Co. reports net profit for the second quarter of the current year, after provision for depreciation, of $1,332,019. Net profit for the first half of the current year is $1,437,863.

Commenting on the earnings, Paul W. Seiler, president of the company, says: "The marked improvement in earnings during the second quarter over the first quarter reflects in large measure the influence of orders received during the first quarter. Production on these was well under way by the end of the first quarter but actual deliveries were not made until the second quarter." Net sales for the six months amounted to $26,963,994.

Iowa Licensing Increases

DES MOINES, IOWA., July 19— Motor vehicle license fees for the period Dec. 1, 1929, to June 1, 1930, totaled $12,063,548.54, an increase of $1,183,534.39 over the similar period of the preceding year, the state department has announced. The collections to date have exceeded the total for the preceding year.

Auto-Lite Abandons Branch

DETROIT, July 21—The branch plant of the Electric Auto-Lite Co. at Adrian, Mich., is being vacated and in the future its activities will be centered in Toledo, according to Lawton Church, manager of the Adrian branch.

Hupp Formulates Traffic Survey

DETROIT, July 19—Having completed its national traffic survey, the Hupp Motor Car Corp. today set forth four provision to be considered in the revamping of existing ordinances or the adoption of any suggested single traffic code.

First, no single law or rule, as respects traffic control, will operate equally well in all municipalities because of varying local factors which must enter into its enforcement.

Second, the adoption or use of any traffic code must, to be efficient and enforceable, be general in scope, flexible in application and easily adopted to the greatest possible number of cities.

Third, a clearer understanding of traffic rules and the needs of the community is necessary on the part of the motorist.

Fourth, a clearer conception of existing conditions and future development of pedestrian and motor traffic control should be exercised by all law-making bodies.

duPont Earns $2.84 a Share

NEW YORK, July 23—E. I. du Pont de Nemours report earnings for the first half of the year, applicable to common stock, of $29,965,357, or $2.84 a share, on average number of common shares outstanding. This compares with $38,674,969, or $3.84 a share, on average number outstanding during first half of 1929.

These include, in addition to regular dividends from General Motors Corp., extra dividend paid during first quarter of this year of $2,993,600 and an extra dividend paid during first quarter of 1929 of $9,981,220. Total income from investment in General Motors Corp. for the six months ended June 30 is $17,965,065, as compared with $24,950,131 in the first half of 1929.

Hudsons Take Polish Awards

DETROIT, July 21—The Hudson Motor Car Co. has received cable notification that three Hudson Great Eight cars finished equal firsts in the annual International Eight Day Reliability Trial sponsored by the Polish Automobile Club. This victory, over the largest field ever entered in the event, gave Hudson the City of Warsaw trophy, the Silver Cup, the Bronze Cup, the Automobile Club Cup and a cup offered by the Vacuum Oil Co. in addition to three gold badges.

General Motors Shifts Export Division Men

NEW YORK, July 22—W. J. Mougey, formerly managing director of General Motors Nordiska, Stockholm, returned to New York aboard the S. S. Albert Ballin last week for a vacation and a new assignment.

Other General Motors overseas executives returning recently include J. E. Hill, treasurer of General Motors Polsce, Warsaw, who arrived on the S. S. Statendam last week for a vacation and a visit to the home office; F. L. Hopkinson, who has been on a special assignment for four months with General Motors Argentina and General Motors do Brasil, returned this week on the S. S. Southern Prince; J. E. Miller, assistant sales manager of General Motors Peninsular, Madrid, returning this week on the S. S. France for a vacation and visit to the home office, and W. W. Ream, chrome-plating specialist, who has been on a special assignment to General Motors South African, Port Elizabeth, who returned last week on the S. S. Majestic.

Clark Airplane Corp. Formed

OKLAHOMA CITY, July 21—The Clark Airplane Corp. has been granted a charter for organization at Ponce City, Oklahoma. The organization of which Richard D. Clark, aeronautic and automotive inventor, is head, and with which Charles E. Reed and George McPhail are connected in executive positions, is to begin immediate erection of their factory at Ponca City for the manufacture of several new aeronautic inventions of Clark, among them an airplane whose design is pronounced exceedingly radical from conventional design. The company has an authorized capitalization of $50,000.

Muskegon Lists Assets

CHICAGO, July 21—Muskegon Motor Specialties Co., including its recently acquired subsidiary, the Jackson Motor Shaft Co., in a balance sheet as of March 31, lists total current assets of $675,170, of which $36,851 was cash and $99,693 in United States Liberty Bonds, against a total current liability of $236,507, a ratio of almost 3 to 1. This gives effect to payment of 37½ cents dividend on the common stock, made on May 10, and the exchange of 70,714 shares of the Jackson Motor Shaft Co., common stock, share for share.

Weatherproof Buys Burwood

DETROIT, July 22—E. C. Morine, president of the Weatherproof Body Corp., of Owosso, Mich., has announced the purchase by his firm of controlling interest in the Burwood Carved Products Co. of Port Huron, Mich. Removal of equipment of the Port Huron plant to Owosso has been started.

Rolling Mills Book Business

Anticipate Resumption of Moderate Schedules

NEW YORK, July 24—Quite a little business from both motor car manufacturers as well as parts makers has been booked by rolling mills in anticipation of a resumption of moderate operating schedules next month. Expectations for August are for a continuance of subnormal demand, so that even a slight increase in buying will be considered cause for rejoicing, and it is quite probable that during the second half of August some covering of September demand will develop.

Intense heat in nearly all the steel-producing districts of the country has impaired output, especially so in the Mahoning Valley, so that, low as operating rates generally are, tonnage yields fell short of the mark to the extent of 10 to 15 per cent. The question before the steel market at the present time is how prices will act during the transition period from the prevailing quiet to broader activity.

In quite a few descriptions of finished steel, demand of late has been so sluggish that even a slight improvement in consuming demand is confidently expected to bring buyers into the market at the same time. Stocks in consumers' warehouses are known to be virtually nil.

Quite often in the steel market, following a period of pronounced dullness, the first sign of a reawakening of the demand engenders intensive competition among mills. On the other hand, a good many lines are selling today at so close to actual cost of production that the more conservative producers are bending every effort to maintain prices and these entertain the hope that there may be an opportunity during the year's last quarter to eliminate the shading that has been going on for some time, and restore a firmer tone, even though conditions preclude all possibility of advances.

Pig Iron—Taking it all in all, the pig iron market is weathering the dull period in good shape. Recent price reductions resulting from intensive competition among furnaces in more or less remote consuming markets have failed to stimulate buying very much, but on the other hand the fourth quarter outlook is rather promising.

Aluminum — From the Middle West comes news of a somewhat better demand, releases being satisfactory by comparison with the month's first half. The sole domestic producer of virgin metal is devoting considerable energy to the development and marketing of special piston alloys. Prices remain unaltered.

Copper—Not all of the producers have gone on an 11 cent basis. Some of the smaller consumers tried to place orders at 11 cents early this week, and encountered difficulties, although large consumers could have had any tonnage they wanted at that price level. For ordinary lots, 11¼ cents seemed to be the general asking price. The leading fabricator has revised prices for copper and brass products on the 11 cents basis for the metal.

Tin—Prompt Straits tin opened the week at 30 cents. The Tin Producers Association issued a statement on Monday to the effect that 94 tin mining companies in Malaya, Siam, and Nigeria, would suspend operations for two months or longer.

Michigan Gear Plans Unit

DETROIT, July 21—The Michigan Gear & Engineering Co. has awarded a contract for the design and construction of a machine shop, 62 by 128 ft. to the Austin Co., engineers and builders. The new unit, which will cost about $25,000, will be used for automotive jobbing.

Timken Bearing Earnings Drop

CANTON, OHIO, July 22—Net earnings of the Timken Roller Bearing Co. for the first six months of this year amounted to $6,120,023.83, or $2.54 on each of the 2,413,967 shares, according to a statement issued by R. C. Brower, secretary and treasurer of the company.

This represents a decrease under the net earnings for the similar period in 1929 when profits amounted to $8,449,198.41. The reduction per share from last year amounted to 96 cents.

Outstanding shares of stock on June 30, 1930, were 2,412,967, so that the earnings for the first half of the year were equivalent to $2.54 a share as compared with $3.51 at the same time last year when there were 2,407,824 shares outstanding.

Earnings for the second quarter ending June 30 were reported at $3,013,364.

States Improve 32,522 Miles

WASHINGTON, July 26 — In 1929 the highway departments of the 48 states improved a total of 32,522 miles of state highways, according to reports received from the departments by the Bureau of Public Roads, U. S. Department of Agriculture. In the year they expended a total of $910,485,291 for highways. They also reported a total of 314,136 miles of highways in the state systems at the end of 1929. The total mileage improved is an increase of 3270 miles over the 1928 figure.

Russians Study at Rouge Plant

DETROIT, July 21—A group of 144 Russian engineers and workers are learning production methods in the steel mills of the Rouge plant of the Ford Motor Co. Among the group is one woman, a metallurgist. The agreement between the Ford interests and the Soviet government provides for the intensive training of Russian engineers and workers in practically all departments of the Ford company.

Begins Valve Production

DETROIT, July 21—The plant of the Wilcox-Rich Corp. at Marshall, Mich., has started production of valves, according to an announcement by J. D. Hill, superintendent of the Battle Creek plant. Initial work is on the Ford line, it is said. The plant at Marshall had been closed for some time.

Chrysler Reduces Price on "70" Line

Four Models Affected in Latest Cut

DETROIT, July 22 — The Chrysler Sales Corp. today announced price reductions on four models of the "70" line. The price reductions are effective immediately.

Old and new prices on the four models affected by the reduction follow:

	Old Prices	New Prices	Saving
Royal sedan.....	$1,445	$1,295	$150
Royal coupe.....	1,395	1,295	100
Brougham	1,345	1,245	100
Business coupe....	1,345	1,245	100

No change in prices were made on the convertible coupe listing at $1,545, the roadster at $1,345 or the phaeton at $1,295.

All Chrysler "70" models are now powered with an engine the same as that formerly used in the Chrysler "77."

To Test Bus Impact on Roads

WASHINGTON, July 23 — Tests of the impact of motor buses on modern highway surfaces will be initiated early next month by the Bureau of Public Roads, U. S. Department of Agriculture, in cooperation with the Society of Automotive Engineers and the Rubber Manufacturers Association. The War Department has made available for the tests a stretch of concrete paving at the Aberdeen Proving Grounds, Aberdeen, Md., and a manufacturer has loaned a large bus of interurban type which will be operated at speeds up to 50 or 60 m.p.h. It is expected that the tests will continue for about two months.

Ex-Cell-O Shifts Two

DETROIT, July 22—N. A. Woodworth, president and general manager of the Ex-Cell-O Aircraft & Tool Corp., has announced the appointment of Elmer C. McKenzie as assistant sales manager. John E. Wells, who has been assistant sales manager, becomes advertising manager. Mr. McKenzie was formerly with the Dura Co., of Toledo. Before that he was with the De Vilbiss organization also in Toledo. Mr. Wells joined Ex-Cell-O two years ago as assistant to W. F. Wise, sales manager.

Pines Making Ford Device

CHICAGO, July 21—Pines Winterfront Co. will start production this week on vertical vane type detachable Winterfronts for Ford cars, J. F. Raleigh, president, announced today.

Triplex Gets Decision

NEW YORK, July 21—Triplex Safety Glass Co. has secured a favorable decision from the United States Circuit Court of Appeals, sitting in Philadelphia, upholding the lower court's decision in its suit for patent infringement against a competitor.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, July 23—The large industries last week continued dull, and there are some who believe that any change must be for the better. There was a slight improvement in retail trade, especially in summer and vacation goods.

BUSINESS ACTIVITY

The preliminary index of business activity for June compiled by the Guaranty Trust Co. of New York, stood at 84.1, as compared with 86.4 for the preceding month and 107.5 a year ago.

FOOD PRICES

Retail food prices on June 15, according to the Bureau of Labor Statistics, were slightly less than 1½ per cent below those a month earlier and 4½ per cent below those a year earlier.

CAR LOADINGS

Railway freight loadings for the week ended July 5 totaled 792,141 cars, which marks a decrease of 119,002 cars below those in the corresponding period last year and a decrease of 58,806 cars below those in the corresponding period in 1928.

CRUDE OIL OUTPUT

Average daily crude oil production for the week ended June 12 amounted to 2,530,800 bbl., as against 2,581,500 bbl. for the preceding week and 2,891,750 bbl. for the corresponding week last year.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended July 19 stood at 83.4, as against 84.5 the week before and 85.6 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended July 16 were 15 per cent below those in the corresponding period last year.

BROKERS' LOANS

Brokers' loans in New York City during the week ended July 16 showed an increase of $40,000,000. Not much importance is attributed to this expansion, for it follows a decline of $898,000,000 during the five weeks preceding.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended July 16 showed decreases of $29,000,000 in holdings of discounted bills and of $14,000,000 in holdings of Government securities. There were increases of 20,000,000 in holdings of bills bought in the open market and of $35,000,000 in total deposits. The reserve ratio on July 16 was 82.0 per cent, as against 81.7 per cent a week earlier and 80.7 per cent two weeks earlier.

Brakeblok Sales Increase

DETROIT, July 22—Sales of American Brakebloks for the first six months of 1930 were more than double the number sold in the same period of last year, according to H. A. Gillies, sales manager of the American Brake Materials Corp.

Rubber Price Hits Bottom

NEW YORK, July 21—Crude rubber prices reached a new all-time low record last week of 10½ cents per pound, according to F. R. Henderson Corp. Trading was light and was retarded by lack of full knowledge as to what action producers will take and also lack of buying activity on the part of American factories. More meetings were held last week among the producing group but no definite action has yet been taken to decrease production.

Arrivals of crude rubber at all ports of the United States for the first 18 days of July are estimated at 15,000 tons. Arrivals during June were 42,655 tons, as compared with 44,490 tons in June of last year.

Stocks in London continued to increase, reaching a total of 80,501 tons, with Liverpool stocks up to 28,226 tons.

Stainless Seeking Plant

CANTON, OHIO, July 22—The Stainless Steel Products Corp., which was incorporated July 19, at Columbus, is seeking a factory site in Massillon, Ohio. The incorporators, F. H. Evans, Merle Evans, Massillon, and Willard Miller, Canton, plan to manufacture stainless steel automobile accessories. The company was incorporated for $75,000 and 2500 shares of no par value stock. The company will employ between 50 and 100 men at the beginning of operations which the incorporators announce will be within six weeks.

Goodyear Opens Fabric Plant

ST. HYACINTHE, QUE., July 22—The Goodyear Cotton Co. of Canada, Ltd., this city, a subsidiary of Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., which acquired the Canadian Manhassett's plant in 1926, recently formally opened its new plant for the manufacture of tire fabric. The new factory is expected to produce about 60 per cent of the cotton fabric used by this company. This new industry will supply work to approximately 800 people and is now in full production and operating 22 hours per day.

Introduces Truck Cab

BUFFALO, July 22—Announcement of a three-passenger coupe type truck cab has been made by the U. S. Body & Forging Co., cab and body manufacturers.

Motorcycles Show Registration Gain

Increase is 11.5 Per Cent in 1929

WASHINGTON, July 22 — Registrations of motorcycles throughout the world showed an increase of 11.5 per cent during 1929, the total number being 2,625,200, as compared with 2,505,804 in 1928, according to the Automotive Division, Department of Commerce. During each of the five preceding years the average increase had been approximately 16 per cent.

Europe again accounted for 84 per cent of the world total and recorded an increase during 1929 of nearly 19 per cent, which, incidentally, is the same percentage registered during 1928. Asia increased its share about 15 per cent, Oceania nearly 4 per cent, while a slight decrease of 1.7 per cent occurred in Africa, which, during 1928, had increased its number of machines 20 per cent. The number registered in America is practically the same as the figure for 1928.

Registrations by continents show that in addition to the number operating in Europe, about 5 per cent are located in Oceania, 5 per cent in America, nearly 3 per cent in Asia and slightly over 2 per cent in Africa.

European manufacturers increased their motorcycle production about 25 per cent during 1929, while American producers turned out about 7 per cent less than in 1928; as a result the ratio of American makes throughout the world fell from about a seventh to a ninth, now numbering some 287,993 machines.

Detroit Steel Reports Loss

DETROIT, July 21 — The Detroit Steel Products Co. has reported a net profit of $56,414, or 28 cents a share, for the second quarter of 1930 and a loss of $145,828, or 73 cents a share for the first six months on 199,335 shares outstanding, as compared with a net profit of $151,010 for the corresponding period in 1928. The comparison with 1928 is made by the company because the latter is more indicative of a year with normal operations. A recovery in the second quarter this year is noted in the reduction of loss per share of $1.01 for the first quarter to 73 cents for the first half. For the entire year of 1929 the company earned $1,023,831.

Michelin Distributes Bonus

NEW YORK, July 21—Michelin Tire Co., Milltown, N. J., will distribute approximately $700,000 among 700 employees who have been out of work since the plant closed down about four months ago, according to announcement made by J. Hauvette Michelin, president. This distribution is taking place under a cumulative bonus plan inaugurated by the company about the time of the World War.

Ford of Canada Earnings Gain

TORONTO, ONT., July 21 — Earnings of the Ford Motor Car Co. of Canada, Ltd., for the year 1929 amounted to $5,232,819 as compared with a net loss of $3,400,651 for 1928. The annual statement covering 1929 shows a surplus of $29,762,904 as against $24,454,684 in the previous year.

Total sales and other income in 1929 amounted to $59,840,535, compared with $47,083,132 in the preceding twelve months. The year's output, including sales of affiliated companies, totaled 87,791 cars, an increase of 12,550.

Wallace R. Campbell, president, stated that conditions in the Dominion, while below normal, are at present better than in any other country in the commonwealth of nations in the British Empire.

Ranger Plans Production

OKLAHOMA CITY, July 21—Production on an extensive scale of planes upon which the company executives and engineering staff have been working for the past seven months is to begin shortly at the Ranger Aircraft Co. plant here.

D. J. Marshall, president, has completed reorganization of the company. Plans call for production of several models the chief one being the plane which has been improved on since first models were put into production, the four-place Ranger cabin monoplane.

National Battery Sales Increased

CHICAGO, July 19—Unit Sales of the National Battery Co. during the fiscal year ended June 30 show an increase of 17 per cent over the preceding 12 months, according to L. J. Shields, president. The increase in the volume of dollar sales, however, made a less favorable showing, due to the lower selling prices during that period.

Austin Produces 1338 in June

DETROIT, July 21—The American Austin Car Co. produced 1338 Bantam cars during June, according to C. A. Best, general sales manager, and with the plant at Butler, Pa., now turning out an average of 125 cars daily, it is expected that the output this month will reach 3000. Plans are being made to produce 5000 in August.

Will Building Coast Plant

OAKLAND, CALIF., July 21—C. H. Will Motor Corp., Minneapolis, Minn., is building a factory for manufacturing and assembling motor buses at Oakland, Calif. The building will cost approximately $50,000 and will be 125 by 200 feet.

+ + CALENDAR + + OF COMING EVENTS

SHOWS

Detroit, All-American Air Derby, starts, July 21
New York, International Import Trade Exposition .....Aug. 4-9
Lwow, Poland, Sample Fair .....September
London, England, Olympia Show...October
Berlin, International Automobile..Nov. 6-16

CONVENTIONS

Society of Automotive Engineers, Aeronautical, Chicago .....Aug. 26-28
Fifth International Air Congress, Auspices Royal Aero Club, The Hague, Holland .....Sept. 1-6
Eastern States Exposition, Springfield, Mass. .....Sept. 14-20
National Safety Council, Annual Safety Congress, Pittsburgh....Sept. 29-Oct. 4
Sixth International Road Congress, Washington, D. C. .....Oct. 6-11
Exhibition—American Roadbuilders Association, Washington, D. C....Oct. 6-11
Society of Automotive Engineers, Production, Book-Cadillac Hotel, Detroit .....Oct. 7-8
Society of Automotive Engineers, Transportation, Pittsburgh .....Oct. 22-24
Motor and Equipment Association, Convention, Cleveland .....Nov. 10-14
N. S. P. A. Convention, Cleveland, Ohio, Nov. 17-21
First International Aerial Safety Congress, Paris, France .....Dec. 10-23

SALONS

Chicago, Drake Hotel .....Nov. 8-15
New York, Commodore Hotel.Nov. 30-Dec. 6
Paris, France .....Oct. 2-12
Prague, Czechoslovakia .....October
Paris, France, Salon (Commercial Vehicles) .....Nov. 13-23
Brussels, Belgium, Salon .....Dec. 6-17

RACES

Spain .....July 27
Italy (Grand Prix) .....Sept. 7
France (Grand Prix) .....Sept. 21

National Carbon Has New Product

NEW YORK, July 21—The Natonal Carbon Co., Inc., has announced a New Eveready "Prestone." The New Eveready Prestone is green in color so it can be readily identified and a green tag is attached to every can of the new product.

Ross Reports Earnings

CHICAGO, July 21—Net profits of the Ross Gear & Tool Co. of Lafayette, Ind., for the first half of 1930 amounted to $256,948. No report for the corresponding period of 1929 is available, but in the initial quarter of this year, to March 31, the company's net income amounted to $89,397. and for the full year 1929, the earnings were $565,581. The 1930 earnings represent $1.71 a share.

Canadian Austin Gets Plant

TORONTO, ONT., July 21—The Canadian Austin Co., Ltd., has secured a plant of 297 Campbell Avenue and will commence operations in a short time. R. P. Clarkson is the managing director.

Thompson Adds Valve Guides

CLEVELAND, July 21 — Thompson Products, Inc., announces the addition of plain and graphite valve guides as a companion line to Thompson valves and its list of other replacement parts.

Briggs Mfg. Co. Reports Profit

DETROIT, July 19—The Briggs Mfg. Co. has reported a net profit for the quarter ended June 30, 1930, of $2,771,066, after all charges, including Federal taxes, equal to $1.38 a share on 2,003,225 shares of common stock. This compares with a net profit of $760,737, or 38 cents a share, in the preceding quarter and with $1,018,130, or 51 cents a share in the quarter ended June 30, 1929. Net profit for the first six months of this year is $3,531.803, or $1.76 a share, compared with $2,422,697, or $1.21 a share for the first six months of 1929.

Briggs Bodies, Ltd., of Great Britain, a subsidiary of Briggs Mfg., has been incorporated and operation will be under way shortly in England for the manufacture of bodies for Great Britain and other foreign countries. Principal customers of Briggs Mfg. Co. are Ford, Chrysler, Packard and Graham-Paige.

Ex-Cell-O Adds Directors

DETROIT, July 21—The board of directors of the Ex-Cell-O Aircraft & Tool Corp., of Detroit, has been expanded from five to nine members, N. A. Woodworth, president, announces. The new members are W. J. Rothmeyer, Richard F. Hoyt, Thor M. Olsen, and John R. Brown. The various plants recently merged with Ex-Cell-O now have moved into the new plant on Oakman Boulevard, with the exception of the Continental Tool Works.

Plymouth Has Two-Door Sedan

DETROIT, July 26—The Plymouth Motor Corp. today announced a new two-door sedan listing at $565, the lowest price ever placed on a Chrysler Motors product. The new body style is finished in Packard blue and black with a black belt molding and gold bronze striping. It parallels the four-door sedan in design and in full-size proportioning.

Oklahoma Receipts Gain

OKLAHOMA CITY, July 21—A total of $6.765.709.61 was received by the state from the sale of automotive licenses in the year ended June 30, 1930, Ed McDonald, secretary of the state highway commission, has announced collections revealed an increase of $96,552.92 over the figure for the fiscal year ended June 30, 1929.

American Sales Increase

BALTIMORE, July 21—The American Hammered Piston Ring Co. has announced that sales for the month of June equaled the May sales record, which was greater than any previous month in the history of the company.